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AIR FORCE
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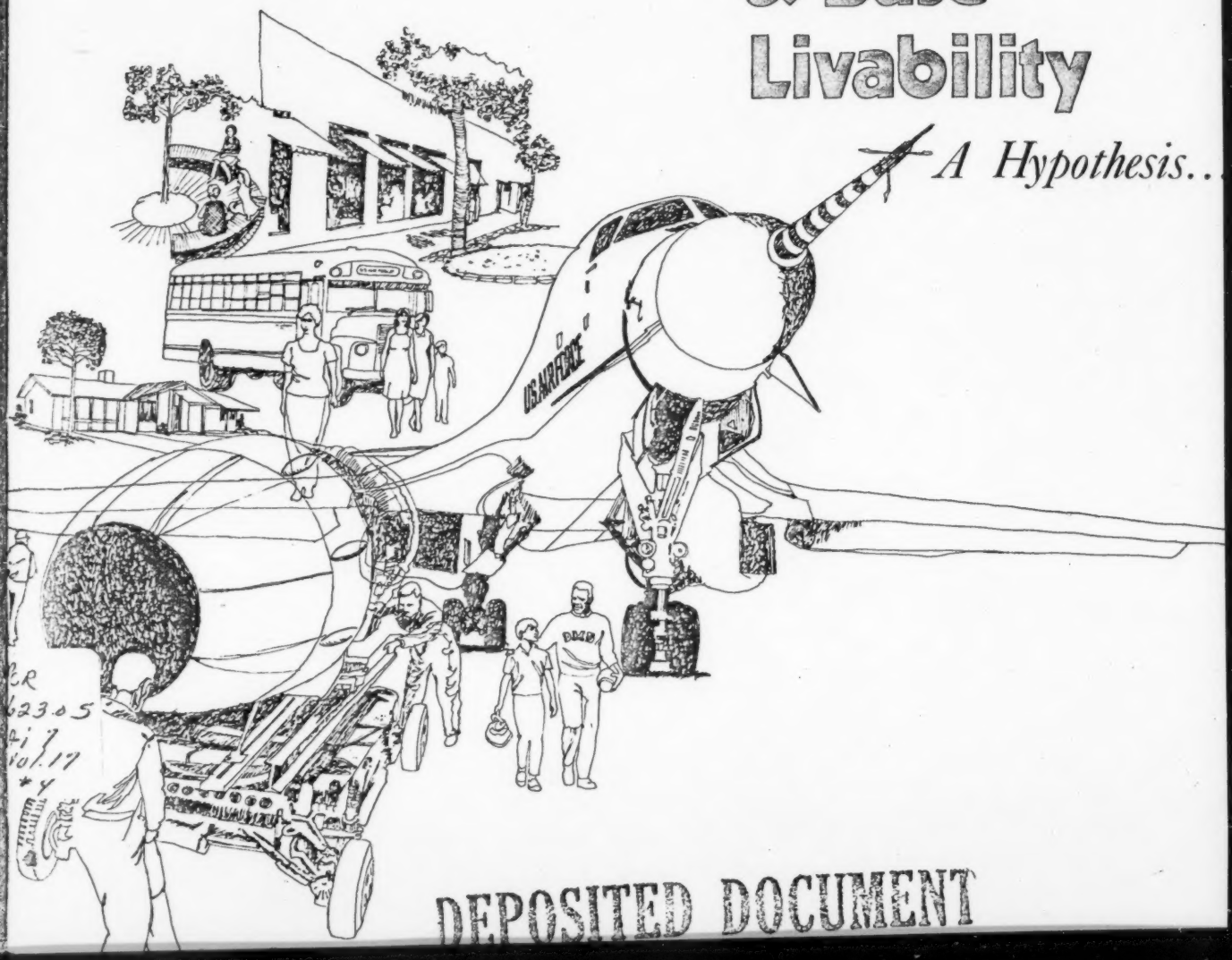
Mission Effectiveness & Base Livability

A Hypothesis...



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Maj Gen Robert C. Thompson
Director
Engineering & Services

From the Director

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Communicating about Good Work

What I am concerned about is that right now, in all of your organizations, there is work going on—good work—which may never be communicated beyond the base where the program or project is taking place. This is particularly so in the case of improvements for people. I am convinced that the models and examples which can guide us best, are already within our grasp and could be used extensively if others knew they existed.

Most of you have had firsthand experience with topnotch projects that were developed, organized and accomplished entirely through the skills and ingenuity of Air Force people. During my visits to the bases, I have found and documented, in more than 250 CESMET reports, many examples of first class work in program management as well as facility improvements. For almost any type of improvement effort, there is now in existence a procedure or program or project which could well be emulated at other locations for further benefit to the Air Force and Air Force people.

For each successful effort there are two important stories. One is about the client, the customer and the program manager. The other is about the programmer, the designer, the constructor and the project itself. These should be documented, sketched, photographed and communicated to others.

There is no "best" way to communicate. Clearly, the most direct and effective method is a vigorous effort at the working level from base to base and from command to command. Also, your magazine, the **Engineering & Services Quarterly,** and the educational programs now being advanced through AFIT can help enormously. But only if the work you do is known to the administration, the editor, the faculty and ultimately to the students.

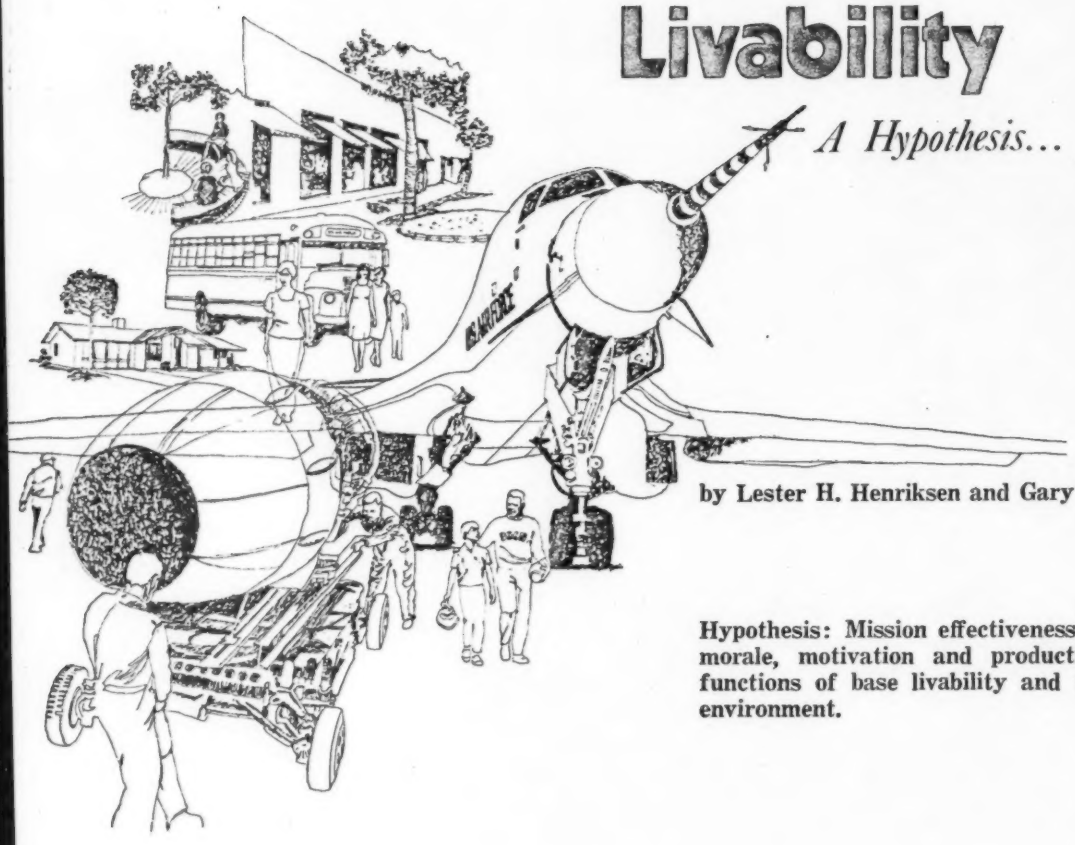
Time spent in documenting good work, for communication to others, is an investment in the Air Force's future.

Robert C Thompson

ROBERT C. THOMPSON
Major General, US Air Force
Director of Engineering & Services

Mission Effectiveness & Base Livability

A Hypothesis...



by Lester H. Henriksen and Gary D. Vest, AIP

Hypothesis: Mission effectiveness is dependent on morale, motivation and productivity which are functions of base livability and the management environment.

Editor's Note: Webster's Dictionary defines hypothesis as "a tentative assumption made in order to draw out its logical or empirical consequences" and states that hypothesis "implies insufficiency of presently attainable evidence and therefore a tentative explanation." This article begins with a hypothesis for the purpose of stimulating debate and discussion of this subject throughout the engineering and services family. This approach is taken because the subject currently does not have a firm Air Force policy framework and thus is in the development stage. In the interest of further developing the theme of this article, supporting comments, criticisms, suggestions and examples are strongly solicited. Correspondence can be forwarded to the authors at Headquarters US Air Force/PREV or to the editor.

The rationale underlying the mission effectiveness and base livability hypothesis is somewhat abstract and illusive. It stems in part from the belief that events and circumstances on the base, but not directly part of the operational mission, can have a major, even dramatic influence on mission effectiveness. It also stems from the fact that many people on Air Force bases are not directly associated with the operational mission. Their actions, individually and collectively, may support or detract from mission effectiveness through a wide range of decisions, contacts and involvements affecting morale, motivation and productivity.

It is difficult, if not impossible, to present this subject in a definitive manner because the linkages between mission effectiveness and base livability cannot be quantified and examined through any sophisticated measure-of-effectiveness process. It is possible that an exercise of proof is not advisable in any case and that this seemingly important relationship must be accepted on the basis of intuition and faith instead of rational analysis. Not only is this subject difficult to discuss, it is also difficult to visibly implement within the base management process. This does not mean that it could not become an important management principle, but it does mean that it probably cannot be tracked and documented the way most base management actions are handled. Of the numerous problems encountered by large, modern organizations, such as the Air Force, one of the most difficult to solve is that of effectively communicating ideas and concepts to the people of that organization. Even when the idea, whether it is new or simply a restatement or reemphasis of an old one, is communicated clearly, positive implementation action by the organization may not occur. This is the case with mission effectiveness and base livability.

Much of the Air Force management process is based on the success and experience gained under unique and highly specialized situations such as remote tours and conditions of increased readiness, national emergency and national disaster. **These situations sharpen the focus, eliminate the extraneous and tend to sublimate individual considerations in favor of the primary goal—the mission.** They also involve, almost exclusively, the Air Force male career population. Observation suggests that success in these hazardous and unique environments may be more readily achieved (even though the difficulties are far greater) than in the day-to-day management of air bases. This may be because the span of individual interests, attitudes and expectations is far more elusive, far more complex and far less susceptible to the mission motivation forces.

Realities

In view of the above, it is important to establish some realistic "givens" at the outset of this discussion or any subsequent discussion of this subject. Perhaps the most important "givens" are:

- **There is a "real world" (what is).**
- **There is what is required by law, policy or regulation (what is supposed to be).**
- **There is an ideal or optimum (what could or should be).**
- **Each base environment is unique and different.**
- **It is not possible to do everything.**
- **A primary function of management is to determine what is most important and to set priorities.**

If one accepts these givens, it follows that the application of the mission effectiveness and base livability hypothesis should be addressed within the context of the individual base management system and by base people.

Base Livability

Base livability may be defined as: **"The total of all the physical, administrative, regulatory and socio-environmental events or circumstances that the individual encounters in the course of his or her life."** Livability is big things, such as, being able to reside in comfortable housing. It is little things, like being able to buy a hamburger at midnight. Livability has to do with satisfying basic needs like shelter, food and clothing, health care and safety. But it also includes convenience, stimulating work and the pleasurable use of leisure time. Livability includes relief from boredom in terms of some place to go, something to do and someone or something to see that is interesting, exciting and satisfying. It is a day and night, indoors and outdoors, on and off-the-job condition which determines individual perceptions and which sets the stage for the morale, motivation and productivity equation.

Base livability is often measured by the individual in terms of direct personal impressions. It may be quantifiable in terms of physical comfort and convenience, equitable pay, compensation and benefits,

educational opportunities and geographic locations. Conversely, it can be considered unquantifiable in terms such as boredom, lifestyle, personal aspirations and values, commitment and expectation. Individuals see livability differently because of varying incomes, intellect, maturity, age, education, social position, rank, grade, marital status, and personal responsibility and motivation.

It is obvious that livability, good or bad, is a value judgement which is based on individual or small group attitudes. This makes the subject extremely difficult to handle because the Air Force, like society in general, contains all types of individuals and groups. At present, there are five to six hundred thousand uniformed active duty personnel. When this figure is expanded by civilian employees, it increases to around 900,000. But taken in total to include wives and/or husbands, children, reservists and retirees, the number of people who consider themselves as part of the Air Force approximates a staggering 3,000,000! **It is suggested that no organization, whether public or private, industrial or academic, foreign or domestic, has a greater stake in matters of livability than the US Air Force.**

Legitimacy and Appropriateness

If one accepts the notions that have been advanced to this point and feels some enthusiasm and interest to pursue the subject further, the question probably arises as to what can be done to improve livability and, in turn, mission effectiveness. Fundamental to moving forward is acceptance of the suggestion that livability can in fact be improved; however, caution is in order.

The subject of livability must be carefully handled. Even in private conversations, the question of its legitimacy and appropriateness to a military organization can arise unexpectedly. For example, some time ago, an Air Force planner, in an after dinner discussion with a service wife, began by describing Air Force base livability in terms of what was wrong and what should be done to improve things. As the discussion went on, the wife became defensive to the point that communication ceased. Only then did the planner realize that he had thoroughly offended the wife because she felt that he was personally attacking and criticizing her chosen way of life. The planner, although speaking sincerely and candidly, simply did not understand her attitudes, did not communicate, was totally ineffective and appeared to be presumptuous. With the multiplicity of views within the Air Force family, those who choose to address livability must do so carefully to avoid this and other equally counterproductive situations.

Knowledge Is Needed

There is, without a doubt, a definite need for more sound, practical and usable information regarding base livability. However, precise knowledge of the potential benefits as well as the limitations is lacking. There is no "model" to:

- Expose, array and order the constituent parts of the livability equation.
- Provide managers and leaders with options, alternatives and a clearer picture of the results of actions and decisions in terms of morale, motivation and productivity and their relationship to mission effectiveness.
- Reveal the strengths presently existing within the system so that other mutually supportive actions can be initiated.
- Reveal weaknesses within the system so that policy, criteria and standards can be appropriately modified.

Livability and Management

Base livability, at least at present, can probably best be addressed through the individual base management and leadership system, operated by managers who accept the list of givens discussed earlier. If this view is accepted, good or bad base livability would seem to depend largely on how well base level managers utilize their resources and their wits in response to both their own ideas and those of the diverse groups of people who make up the base population. Those who try to go it alone, like the planner cited earlier, will probably find it very difficult.

Some would suggest that the management factor is quite simple in that all that is necessary is to provide an acceptable level of functions, activities and facilities that the individual normally cannot provide for himself or herself through personal initiative. The problem with this approach is that what is acceptable is measured differently by different people and groups. One can only conclude that there needs to be some type of mechanism to input Air Force people needs and desires into the base management decision making and priority systems.

In management terms, base livability is quite different from operational mission management which tends to be fairly well definitized and standardized, as it should be. Air Force people can readily understand and accept policies and rules regarding operational mission accomplishment. They also accept the realities and sacrifices of losing a large project which doesn't get funded. On the other hand, it is difficult for anyone to understand base functions which do not seem to work for those who they are supposed to serve, such as:

- A less than understanding and effective housing referral office.
- A BX or commissary that always seem to be closed when it is convenient to use them.
- Community facilities that are unaccessible to those without automobiles.
- Athletic fields without drinking fountains and toilets.

Job Livability: What it takes to make something worth doing

by Rich Johnson
Professor of Management
Civil Engineering School

"How can jobs be made more livable?" The answer to this question directly connects to effective on-job effort and mission accomplishment.

A livable job has two parts, and each of us needs as much of both as we can get:

- Part One is **reasonable treatment.**
- Part Two is **having something worthwhile to do.**

One is no substitute for the other. It takes both.

In classes at the Civil Engineering School, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, over 100 of you have written down your feelings about what it takes to have "something worthwhile to do." I have summarized your answers. It seems to me that any boss who thinks about your comments will find several practical ways to create a more effective workforce right in his own shop.

In summary form, here's what you said:

1. **Give me high volume**—plenty to do, it hurts me to stretch out the work.
2. **I like "project type" work**—give me several projects. I enjoy the excitement of beginning something, facing challenge, completing something.
3. **Give me clear goals.** Name your game, be specific, and I'll give you the best I've got!
4. **Give me resource choices.** I don't necessarily want more resources—but let me **choose** the mix or combination I need to do my job.
5. **Give me time choices.** Usually I can live with our deadlines. I'm not asking for deadline extensions. I am asking for the right to choose **when** I do a particular task in order to meet the deadline.
6. **Give me feedback.** I want fast, technical feedback about my work. I want to know in time to intervene and adjust if something is going wrong. And make that feedback specific and technical so I can do better next time.
7. **Let me communicate with the rest of the system.** I don't want to change the Air Force; however, I do want to **occasionally** talk with people outside of our own shop. Sometimes the work is loused up when I get it—and sometimes, all it takes to get it right is a little direct communication.
8. **Make me accountable.** Once we understand each other about what I'm supposed to do, let me show you I'm dependable—and then, damn it, trust me!
9. **Let me build my reputation.** I want to be a **key** man. I want to be at least the best on the base in my work. If I get the jobs, materials and general backing that let me run up a series of successes, we'll both be proud!
10. **Give me high visibility.** Everytime it's possible, I want everyone to know that I've got the duty. If necessary, I want the base commander to know that the Air Force can sleep tonight because I, **by name,** am on that hot job—and the job is going to be done right!

Livable jobs take both reasonable treatment and something worth doing. The two parts **together** relate to on-job effectiveness and mission accomplishment.

The 10 point summary of your feelings gives some specifics on what it takes to make something worth doing. Your answers fit with a good bit of current research. More important, **your answers make sense.** Each of us should give those points a thoroughly good thinking.

- A club or cafeteria that does not seem to live up to its advertisements.
- A base bus that is either always late or just does not show up.

Each base, no doubt, has its own list of potential base livability difficulties. Unfortunately, managers who can change and correct these situations sometimes do not even know that they exist, often because of the heavy demands on their time and the fact that no one tells them that something needs to be improved.

Point of Departure

As a point of departure for future discussions on base livability, it is suggested that there are four fundamental actors or groups of actors in the base livability equation. They include

- The individual.
- The resident population.
- The commuter population.
- The management structure or corporate leadership.

It is further suggested that the viability, effectiveness and stability of the base level organization depend on:

- How management performs in carrying out its responsibilities.
- How the individual performs in the eyes of management.
- How the resident and commuter populations view the actions of management.
- How management views the actions and performance of the resident and commuter populations.

Of the factors indicated above, little is really known with the exception of how the individual performs in the eyes of management. The system exists for telling the individual, with crystal clarity, what the organization expects from him or her and, in turn, for telling how well he or she measured up. Adequate mechanisms to address the other factors do not exist.

Work Underway

At the Civil Engineering Center, Tyndall, AFB, Florida, a series of projects have been initiated to investigate certain critical aspects of the livability

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question as they pertain to residential, commercial and community services situations. These investigations are intended to produce information which will be immediately usable to the Base Civil Engineer, his staff and other base level managers in planning and carrying out livability improvements. At the Civil Engineering School, Wright-Patterson AFB, Ohio, major new emphasis is being placed on matters of functionality and livability in the technical and management programs. At Air University, Maxwell AFB, Alabama, in the leadership and management development center, a new course for commanders and key staff personnel is presently being developed. A portion of this course will also focus on base livability.

In spite of the work underway, it is not necessary to await the outcome of these actions before initiating base level livability assessments and improvement activities. It is possible and desirable to begin organized, cooperative examinations of the following to see how well they are presently serving the needs of Air Force people in residential areas; commercial areas; social and recreational areas; and work areas.

The results of these base level initiatives, combined with the work that is underway at the Civil Engineering School, the Civil Engineering Center, and at Air University can provide important additional information and perspectives on mission effectiveness/base livability.

Hypothesis

The hypothesis stated at the beginning of this article has neither been proven nor disproven. It is, however, suggested that there is sound justification to pursue the mission effectiveness and base livability relationship at all **levels of command.** It is also readily apparent that much good work has already been done throughout the Air Force on improvements for people. It is now important to **communicate information** regarding these and future successful efforts because this evidence goes far toward proving and institutionalizing the mission effectiveness and base livability hypothesis.

E&S

How to Increase Distribution to the Quarterly

Requests concerning placement of engineering and services organizations on the distribution list of the **Air Force Engineering & Services Quarterly** continue to come into the editorial offices at the Civil Engineering School at Wright-Patterson AFB, Ohio. Even though the **Quarterly** is published at the School, distribution is handled by Publication Distribution Offices (PDOs) worldwide.

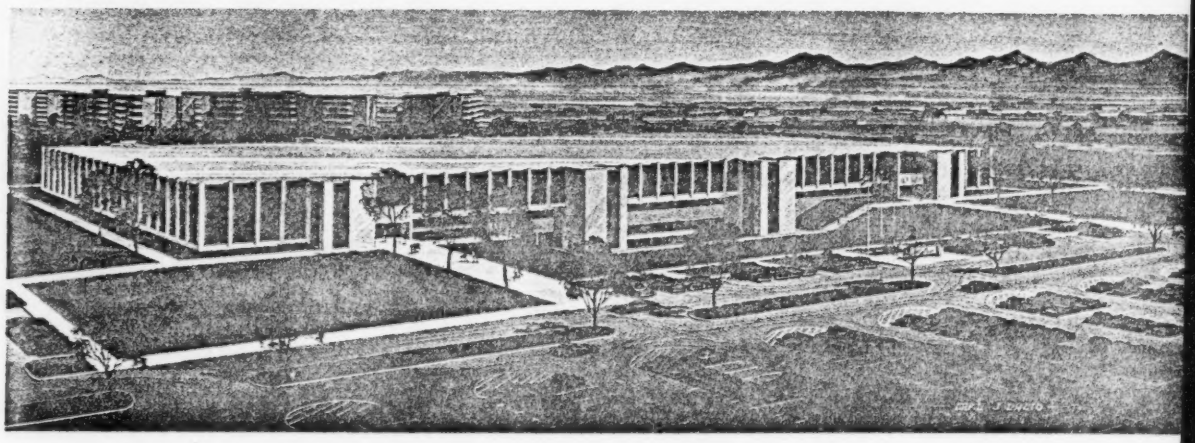
An organization seeking to increase its distribution must contact the PDO located on its respective installation. Increases will be granted only if the requesting organization meets the established criteria which is: **one copy for every five engineering and services personnel in an organization**; therefore, if your organization has 125 personnel, then it should receive 25 copies of the publication on a continuing basis.

If your organization meets the criteria, fill out Air Force Form 764A which the PDO will supply. Once the request is verified, it will be submitted through channels and increased distribution will result.

Whenever a question arises about distribution of this publication, always contact the PDO on your installation. The editorial offices do not make distribution.

The primary goal in design and construction efforts of the Air Force Accounting and Finance Center at Lowry AFB was to meet mission essential requirements. Success in attaining a people-oriented facility was also considered an inseparable part of that goal. The Air Force's acceptance of the facility stands as a . . .

Monument to People Oriented Construction



by Maj Peter LoPresti, PE, and William L. Kollman, PE

When dedication of the newly constructed Air Force Accounting and Finance Center (AFAFC) at Lowry AFB, Colorado, was held on 30 September 1976, it marked the Air Force's acceptance of a significant monument to people-oriented construction. The big payoff that the Air Force received is in terms of a facility that generously enhances mission accomplishment and, at the same time, provides exceedingly pleasant surroundings for employees in the facility that is functionally superior and flexible in layout. These fringe benefits were not obtained without a concerted effort on the part of the many participants. Firsthand observation and smiling comments from AFAFC personnel are proof enough that the efforts were worthwhile and the payoff is there.

The primary goal in designing and constructing the approximately $21 million Finance Center was to provide a facility to meet mission essential requirements. **Success in attaining a people-oriented facility was considered an inseparable part of that goal.**

While the Finance Center widely employs computers, people remain the indomitable key to mission success. A successful design, therefore, demanded attention to methods and effects to improve employee productivity. The Air Force Regional Civil Engineer/Design Agency team at Dallas, Texas, insisted on a maximum, conscious effort by the designer to "understand" the nature of the organ ization and intricacies of the job. This was to include the anticipation of job-related frustrations encountered by personnel. Another important consideration was to provide an architectural statement to reflect the image the Finance Center wished to project.

Once a "philosophy" of design was established, the designers could concentrate in a free-wheeling fashion on how to meet the needs and aspirations of the user. This presented the architects and engineers with a clearly defined open challenge. Creative minds combed state-of-the-art techniques and available materials to arrive at a potentially award winning result for both exterior and interior treatments. A brief description of the Finance Center's mission will help in order to fully appreciate the design techniques employed.

AFAFC Mission

When an Air Force layman envisions the Finance Center, he more than likely conjures up the pleasing thought of a friendly green, computer-card-sized check or computer printout receipt rewarding him for his efforts. That is certainly an appropriate vision; however, it is just a small part of the action. Under the Air Force Comptroller, the AFAFC functions cover responsibility for supervising the entire Air Force accounting and finance network. That is a mind-boggling thought. One can imagine how that impacts on just the Base Civil Engineer's operation, not to mention the other portions of the Air Force. Further, imagine the number of sub-accounts and budget breakdowns that infest the Finance Center's responsibility. As the focal point for all Air Force appropriated and nonappropriated dollars, financial data and reports filter in from over 450 activities around the world. Millions of transactions are processed in finite detail and reports are issued to appropriate Air Force and other governmental agencies, such as the Treasury Department, Office of the Secretary of Defense, Office of Management and Budget and the Congress. It would appear there is no end.

More personally affecting those of us who are members of the Air Force, is the receipt of inquiries from base accounting and finance offices. These inquiries are answered by cathode ray tube remote units which provide instantaneous readouts from pay files. In spite of this capability, about 44,000 telephone call inquiries reach the Center each month. Many other inquiries are handled by message and letter. In addition, the Air Force Reserve Personnel Center is also located in the facility, and it is responsible for both the financial and personnel transactions for all reserve forces. That, in itself, is a sizeable task.

The effects of dealing with numerous reports, files, surveys, inquiries, etc., in such detail, can take a toll on people. Certainly then, working conditions become a significant factor. To maintain success in accomplishing their services-oriented mission, the Finance Center required a facility that complemented its production. What follows now, is a broad description of the more important design considerations and how they were integrated into the final product.

The Final Product

The building site selection was based on economics. An existing 12 inch thick concrete aircraft parking ramp, no longer used since Lowry AFB has no flying mission, was used as a parking lot for 1,700 cars. An environmental statement had been properly prepared and filed for this project, with no objections by any governmental agencies. During the advertising period for construction, however, a group of homeowners who live in the vicinity of the site, made demands which were strongly supported by federal officials. After a series of meetings, it was determined that relocation of the parking lot would reduce the "visual pollution" that the homeowners objected to. This was to be accomplished by expanding landscaping, adding berms and removing all concrete not used for recreational purposes. The parking lot was relocated to another area of the ramp, and most of the 12 inch thick

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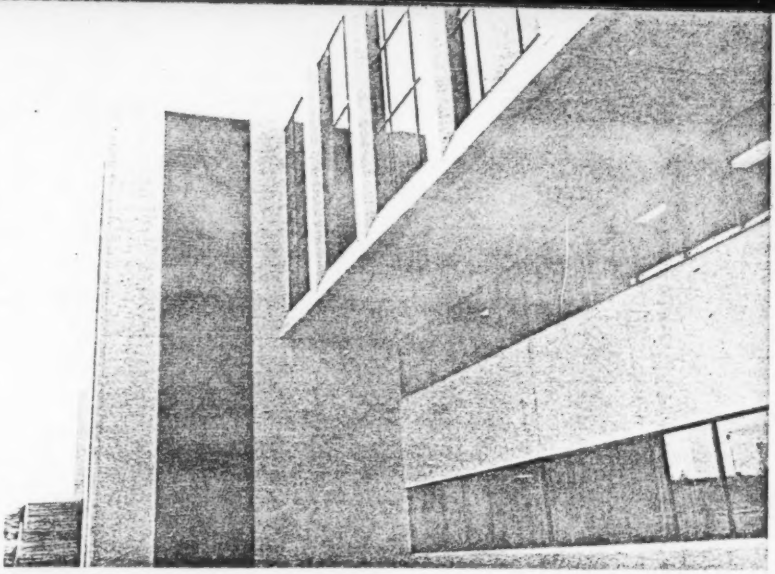
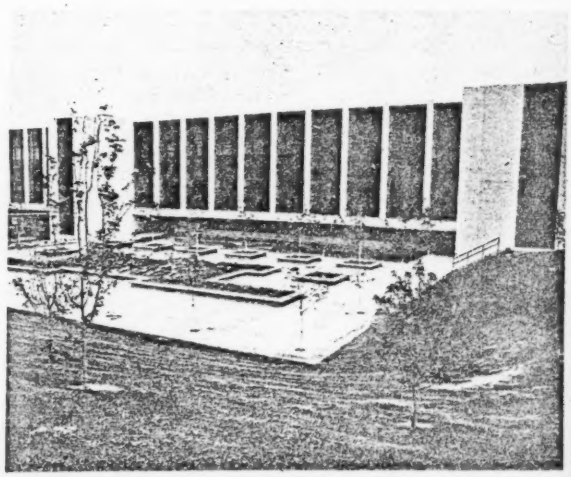
AFAFC's computer room is the heart of the Finance Center. Pay records of all Air Force members are centralized on advanced computer equipment.



The new Finance Center has three floors—one below ground at garden level—that houses 3100 employees.

The Air Force Accounting and Finance Center and Air Reserve Personnel Center is a modern structure that contains almost 605,000 square feet of work space under one roof. Personnel had moved into the facility in early September.

Interior of the new facility features spacious, well-lighted areas that insure the comfort of the employees.



A patio area in the rear of the new facility provides an attractive setting for work breaks and lunch periods.

concrete adjacent to the building was removed to prevent future use as a parking lot. Two rectangular areas, totalling approximately three acres, were retained. One area has been developed and is equipped with tennis and basketball courts; the other has been surfaced and will be developed as future recreational needs dictate. The addition of berms, choice of plantings and recreational areas have created a park-like atmosphere compatible with the Denver life style.

Special attention was given to the external treatment of the building to provide a crisp, clean, bold appearance representative of the mission of the Finance Center. This was accomplished by the use of bronze-tinted glass and spandrel panels, with slender vertical precast ribs positioned 15 feet on center to relieve the expansive 300 and 660 foot elevations. Each of the two main entrances is capped by a precast, seven foot diameter reproduction of the Air Force emblem. A depressed courtyard between these main entrances is multi-purpose. First, it allows exterior entry by stairways to the lower, below grade floor. Secondly, its landscape treatment, including mountain aspens, adds to the aesthetic beauty of the site and provides a break between the building and personnel service area.

Flexibility Was Basic Concept

Because governmental agencies are noted for frequent shuffling of offices to meet varying personnel requirements, the basic concept of design was for flexibility. This was accomplished by in-the-floor grids of electrical and communications ductwork, modular design treatment of lighting and air conditioning, and the use of demountable partitions throughout. The architect-engineer, through intelligent, effective dialogue with management, established not only the functional requirements of each organization, but also the lines of verbal and written communications for the staking out of territorial boundaries. Only those walls defining permanent areas are of permanent construction—the eight service towers, two interior service cores, cafeteria, computer and communications areas, auditoriums, and the like. All other walls are demountable.

The architectural treatment of the remainder of the interior was based on the "office landscape" concept, with accent on communications and workflow for efficiency. A separate "landscape" plan was developed for each directorate. Full height partitions were provided only where visual privacy was a prerequisite. Noise suppression was obtained by the installation of acoustical ceilings, carpeting of all office floors, and a prudent use of partial height partitions. A public announcement system was installed throughout, which adds background music to enhance the pleasant working surroundings.

The effective use of color as an interior design tool creates a contemporary ambiance in which 3,000 plus employees can live for their 40 hours a week. A geometrically patterned carpet was selected, with a different basic color for each of the three floors to establish the color schemes. The lavish use of complementary and contrasting, subdued and bold accent colors, aids in focusing attention on tasks or relaxation, as the needs dictate. These colors aid in breaking up the gun-barrel effect of necessarily long corridors. Additionally, oversized graphics in contrasting colors direct personnel down these corridors to the auditorium and cafeteria.

The cafeteria was designed by the Army-Air Force Exchange Service which is also responsible for its operation. The open space layout of the serving area permits customers the convenience of selecting individual items, such as a salad, dessert or drink, or a full meal, without waiting in line. The dining room offers a choice of booths and tables and features accent colors chosen for appetite appeal. If preferred, patrons can lunch or take a break by sitting around large planters in the courtyard located on the south side of the building.

The heart of the facility is the communications-computer area and occupies 35,000 square feet of floor space. To prevent any downtime that a power failure may cause, emergency generator and Uninterruptible Power Supply (UPS) systems have been installed. A Halon 1301 fire supression system provides fire protection for this area. All of these measures have been included to assure the continuous flow of product: over nine million checks and 1,750,000 bonds annually; 93,000 computer reports; and 21,000,000 completed personnel payroll computations. This makes for a grand total of 856,000,000 lines of print annually!

Design for Tomorrow

The new Air Force Accounting and Finance Center building is an important and revealing precedent for the design of Air Force administrative-type facilities. Indeed, no two administrative facilities present the same situations. Generally, the overwhelming majority of design techniques and applications used on the Finance Center can be favorably applied to other administrative facilities. Care must be taken, however, to avoid oversight of unique situations requiring unique solutions. A fully developed design "philosophy" can avoid such oversights and aid immeasurably in successful production of people-oriented facility designs. The opportunity to succeed is considerably greater now with the advent of many new attractive cost competitive materials and growing user appeal (if not demand) for attractively appointed government facilities.

The Air Force Regional Civil Engineer office in Dallas is honored to have played an important role in enabling the Finance Center to better serve the total Air Force mission—the big payoff. E&S

Directorate of Engineering and Services

Current Emphasis

brief commentary on significant developments

FACILITIES ENERGY CONSERVATION--Significant achievements by installation energy managers resulted in a 3.7 percent reduction in facilities energy used during FY 76 as compared to FY 75. The amount of facility energy conserved equates to 53 million gallons of fuel oil that would have cost approximately $18 million.

AIR FORCE CARPET POLICY--HQ USAF/PRE ALMAJCOM letters dated 6 Jul 76 and 27 Aug 76 provide new policy guidance regarding authorization for increased use of carpet as a floor finish/construction item. Carpet has been deleted from most of our Tables of Allowance; the BCE will now approve and fund for all wall-to-wall carpet.

INFORMATION SYSTEMS--AF/PRE has conducted an analysis of work force management procedures to simplify and redirect information systems toward base level requirements. A strawman concept was developed by HQ USAF, MAJCOM, base and Design Center representatives at Keesler AFB in Oct 76. Testing of new procedures at selected bases is projected for mid-1977.

FAST AMORTIZING PROJECTS--HQ USAF reports that an increased emphasis on resource savings in all areas has resulted in a corresponding increased emphasis on fast amortizing minor construction projects. These projects can be submitted at any time in accordance with AFR 86-1 procedures and will be given priority attention by HQ USAF. However, to qualify as a fast amortizing project, it cannot exceed $400,000 in funded cost and it must result in a cost savings that will amortize the total cost of the project within three years of completion. The cost savings must be documented in an economic analysis which is prepared as outlined in AFR 178-1.

BACHELOR ENLISTED QUARTERS IMPROVEMENT PROGRAM--A program has been initiated to provide adequate housing for all bachelor personnel who reside on a base. A solid, integrated, fully coordinated 7 year (FY 77-79 O&M and FY 79-83 MCP) program for improving all bachelor enlisted housing is being developed. The full cooperation and active participation of appropriate elements at MAJCOM and base level will be necessary to achieve the desired results.

WIND ENERGY--The Civil Engineering Center has completed plans for the installation of a 15 KW wind generator at FE Warren AFB. Testing, scheduled to start this month, will include data collection on design, installation, maintenance and operating costs, meteorological factors and control systems. Feasibility of remote site applications will result from this test project.

UTILIZATION OF FAMILY HOUSING--Downtime at change of occupancy of family quarters decreased during the 1 Jan-30 Jun 76 reporting period. During the previous six months, downtime averaged 9.4 days per move out; the figure has dropped to 7.5 days. The average for adequate housing was 7.6 days, while inadequates averaged 5.9 days of vacancy per move out. Increased emphasis is needed to continue the trend toward achieving the vacancy standards of AFR 90-6, Table 3.

REVISION TO AFR 91-5, UTILITY SERVICES--AFR 91-5 revision to be published and distributed in October 1976 is being implemented immediately by PREM ALMAJCOM letter 30 Aug 76. The revision increases approval authority (continued next page)

of major commands for connection and termination liability changes, utility procurement contracts, and rate increases; changes the basis for installing meter for rates and who pays for them; and gives major command approval authority for utility rates outside base limits.

REVISED SMOKE DETECTOR CRITERIA MFH--The criteria for the selection and purchase of smoke detectors in military family housing is being revised. Presently, photoelectric detectors are recommended with procurement limited to GSA, GOCESS and COCESS. The revised criteria allows either photoelectric or dual chamber ionization detectors. Procurement can be either through government systems or the commercial market, whichever is most advantageous.

AAFES OPERATION OF MILITARY CLOTHING SALES STORES--All Air Force military clothing sales stores are now operated by the Army-Air Force Exchange Service (AAFES). Major installation commanders' responsibilities for clothing stores are the same as for other Exchange activities (Reference: AR 60-10/AFR 147-7 and AR 60-20/AFR 147-14).

FY 1978 MCP--The FY 1978 MCP has been submitted to OSD for review prior to Congressional submittal in Jan 77. Fenced items such as energy, pollution abatement, weapons security improvements, medical and aircraft shelters constitute about 35 percent of the total program. Equipment-related items and support such as flight simulators, C^3, NAVAIDS, AICUZ, design and minor construction take up about 20 percent of the program. The remaining 45 percent is for deficiencies, modernization, replacement and other mission support items.

CATHODIC PROTECTION--The Air Force Corrosion Analysis Team finds that many bases cannot perform testing and maintenance of cathodic protection systems because they have no equipment. TA 486 contains the basic test equipment authorized per base for use by the electric shop. This small investment of about $2,000 maximum will go a long way toward prolonging the life of the millions of dollars worth of underground piping at each base.

LEASE RENEWALS--AFR 87-1, para 2e, states that each command establish and monitor procedures that will assure submission of lease renewals requiring approval of HQ USAF/PRER (those with an annual rental over $25,000 and leasehold condemnations regardless of cost) six months before expiration date. Each renewal must be accompanied by an environmental assessment (AFR 19-2), except when an assessment has been made previously, and no change in use is contemplated. Similar monitoring procedures should be established for those bases within command approval authority.

UNIFORM CLOTHING FOR WOMEN--A recent Inspector General report indicated that some personnel involved in furnishing clothing and related safety equipment were not familiar with current information/procedures. CSAF/PRE ALMAJCOM message 201500Z Jul 76, Subject: Information on Clothing Items, identifies sources of information concerning supply of clothing to Air Force personnel.

TRANSFER OF FUNCTION--Aircraft fire/rescue research, development and equipment acquisition program management has been assumed by the Air Force Civil Engineering Center, Tyndall AFB, Florida. Requirements for research and development should be submitted by letter to MAJCOM for comment and forwarding to AFCEC.

FIRE PROTECTION SCHOOL--In line with ATC policies, the USAF Fire Protection Training School at Chanute AFB, Illinois, will suspend training during the Christmas-New Year holiday period. Personnel scheduled for training during the month of December 1976 should verify class dates because most all December classes will be cancelled in the TDY advanced courses.

Requiem for An Engineer

Major General Frank G. Barnes who had served in various civil engineering positions at base, major air command and Headquarters US Air Force levels during a career that spanned 27 years, died at the USAF Medical Center at Wright-Patterson AFB, Ohio, on 25 September 1976, after a short illness. At the time of his death, he was the Deputy Chief of Staff for Engineering and Services, Headquarters Air Force Logistics Command at Wright-Patterson AFB.

To those who knew him well, General Barnes was a towering figure, not only in physical stature (he was 6 foot 3 inches tall), but also for his professional leadership and engineering expertise. A member of the fabled Army football team that starred the legendary Doc Blanchard and Glenn Davis during the mid-1940s, the drive and determination he displayed on the football field were to become his trademarks in his chosen field of engineering. Whatever the assignment, he accepted the challenge.

Upon graduation from the US Military Academy at West Point in 1949, he accepted his commission and took his first assignment as an officer in the military as a student at the Air Tactical School at Tyndall AFB, Texas. His next assignments were to include attendance at special weapons courses at Keesler AFB, Mississippi and Sandia Base, New Mexico; weapons officer in the United Kingdom; and operations officer with the Civil Engineering Group at Reese AFB, Texas. In between the past two assignments, he entered Purdue University under an Air Force Institute of Technology program and earned his master's degree in civil engineering. While there, he was

Maj Gen Frank G. Barnes

tapped for membership in Tau Beta Pi, the national engineering honorary fraternity.

General Barnes' actual development as an engineer in the Air Force was initiated in early 1958 when he served successive assignments as the Base Civil Engineer at Kunsan and Osan ABs in Korea.

In his assignments in the years to follow, he became a respected and dedicated individual who worked untiringly to make civil engineering a more responsive function in the Air Force. His background in the various positions he served in at base, command and Air Staff levels, can only be described as an example of a man who completed the full cycle in his vocation. He was the "complete engineer."

Following his assignments at base level in the Far East, he became the Project Engineer on construction programs for the Titan I missile program at the Ballistic Missile Division in Inglewood, California. He then assumed the responsibility for propellant loading systems for all liquid fuel missile and space programs. Shortly thereafter, when the emphasis shifted to solid propellant missiles, he became Chief of the Operational Base Design for the Minuteman program.

His expertise in construction matters was called upon once again and he joined the Base Civil Engineer organization at the US Air Force Academy where he played a significant role in the construction program to accommodate expansion of the cadet wing. When the Vietnam conflict broke out, he went overseas to serve in the Military Assistance Command (MACV), contributing his engineering know-how to the heavy construction efforts there. This assignment was followed by his selection as Assistant Chief of the Construction Division in the Directorate of Civil Engineering at Headquarters US Air Force. Later, he became Chief of the Civil Engineering Programs Division, with the responsibility for developing all civil engineering programs including military construction, minor construction, nonappropriated funds and operations and maintenance.

General Barnes was then elevated to Deputy Chief of Staff for Civil Engineering at Tactical Air Command at Langley AFB, Virginia. As part of the total force concept, he played a key part in the development of training programs for the 98 civil engineering flights and two civil engineering squadrons (heavy repair), of the Air Force Reserve forces which were designated as TAC gaining units for wartime mobilization. While in this position, he was promoted to the rank of brigadier general. He then was named Deputy Chief of Staff for Civil Engineering at Headquarters Air Force Logistics Command at Wright-Patterson AFB.

cont'd on page 17

A Talk with the Commander of AFCOMS

Air Force Commissary Service became fully operational on 1 October 1976, under the command of Maj Gen Daniel L. Burkett. A month before, the Quarterly's editor, George Dimitroff, visited Kelly AFB, Texas, for an in-depth conversation with the first commander of the Air Force worldwide commissary store system. General Burkett spoke on various details about AFCOMS and what he foresees for the future.

"Commissaries on Air Force bases will continue to be viable and they will continue to provide a real benefit to Air Force patrons. There is no activity going on or any design or master plan to close the commissaries. We are here to stay."

When Major General Daniel L. Burkett uttered these words during a recent interview, they were spoken first to dispel any misconceptions that people may have about the Air Force commissary store system, and second to emphasize the significant role that he and the Air Force Commissary Service he commands will play in maintaining commissaries as a definite benefit for Air Force personnel.

Headquarters Air Force Commissary Service (AFCOMS) at Kelly AFB, Texas, is one of the newest organizations in the Air Force. It was activated on 1 January 1976, officially opened for business on 1 April and became fully operational less than a month ago.

AFCOMS is a separate operating agency with a specialized mission, directly subordinate to Headquarters US Air Force. It is somewhat unique, according to General Burkett, because it is an

appropriated fund entity governed by a Board of Directors. The chain of command is directly from the Air Force Chief of Staff to the Board of Directors to AFCOMS. This type of organization, the General confided, affords AFCOMS considerably greater freedom of action and flexibility and provides an identifiable corporate decision-making process. "It aligns us on a parallel to the private sector and involves Air Staff representation at the highest level for collaborative management."

AFCOMS will exercise control of the commissaries through four region offices, conveniently located, to administer and supervise the commissaries assigned to their geographic areas. They include the Western Region at Norton AFB, California, with responsibility for 23 commissaries, nine site branches and nine overseas stores; Central Region which is co-located with HQ AFCOMS at Kelly AFB, with responsibility for 36 main stores and five site branches: Eastern Region at McGuire AFB, New Jersey, with responsibility for 40 commissaries plus 13 site branches; and the European Region with offices near Ramstein AB, Germany, with responsibility for 29 stores and nine site branches.

"Literally, we are an organization that started from scratch," General Burkett said. "This fact alone offers many advantages but also presents new challenges. We will not be constrained by yesterday's ways of doing business," he emphasized. "We have the rare opportunity to create a new system totally dedicated to improving commissaries throughout the Air Force."

General Burkett came to Headquarters AFCOMS after having served as Deputy Commander at the Army-Air Force Exchange Service in Dallas. Obviously, the three years he spent in that position had a great impact on his assignment to AFCOMS.

When this interview actually began, he opened the talk by saying that just the mention of the word "commissary" among active force and retired personnel and their families generates unusually intense interest. "With many people, it is a very emotional issue and one that different people perceive in different ways," he said. "There are those who are convinced that the current debate on appropriated fund support spells out the 'swan song' for the commissaries or that loss of this support will reduce customers' savings to the point that the Air Force will lose all of its business.

"We have the rare opportunity to create a new system totally dedicated to improving commissaries throughout the Air Force."

"The only universally accepted point is that commissaries represent one of the most valuable benefits that active duty and retired personnel have," he continued. "In all the surveys I have seen, the commissaries and medical care are considered the two most important benefits that our personnel have. Thus, it is obvious that our charter is to retain that benefit. I am convinced that we can do that."

Admitting that elimination of appropriated funds for direct costs of commissary operations would present a major challenge, General Burkett said, "There are a number of management actions we can take to reduce that impact and to place the commissaries in a more business-like posture."

When asked what AFCOMS thrusts are to centrally direct the management improvement and administrative consolidations of Air Force commissaries, he said aggressive application of management techniques and efficient business practices will result in significant progress. "We intend to devote our efforts toward those objectives," he said.

The aggressive management the General referred to has al-

Maj Gen Daniel L. Burkett became Commander of the Air Force Commissary Service in March 1976, after serving as Deputy Commander of the Army-Air Force Exchange Service at Dallas earlier. A senior navigator and command pilot, General Burkett has filled command and control positions at wing level, Headquarters Fifteenth Air Force and Headquarters Strategic Air Command. In addition, he was assigned to various computer and data automation positions at Headquarters US Air Force. He has degrees from the University of Nebraska and George Washington University and is a graduate of the Air War College.

ready made itself evident. Only recently, AFCOMS completed taking over the operational control of all the commissaries in the Air Force. The action was initiated in early July and was finalized last month. Additionally, AFCOMS has assumed the responsibility for those reports and data that formerly went to the Air Force Services Office in Philadelphia which previously managed operations of the commissaries.

In creating this vertically aligned system, General Burkett continued, AFCOMS has also instituted a two-phased program of consolidating the management and control functions of commissaries. Phase I involves the consolidation of 18 stores into nine complexes. All personnel engaged in the administration, requirements computation and accounting functions, and all management personnel above store level, are being consolidated and will perform these functions for the two stores.

Phase II will involve the further consolidation of additional commissary stores into complexes with as many as four stores in a complex. As an example of this, he said Travis, McClellan, Mather and Beale AFBs are located within about 100 miles of each other. "It is 'a natural' to bring the four stores in those locations under one management," he said. "It is cost effective and as far as the service to the customer is concerned it will be every bit as good as or even better than before."

In discussing cost effective operations, General Burkett stressed that it will produce substantial personnel savings through the elimination of the current duplication of work and through the more effective use of remaining manpower spaces.

"Regardless of the outcome of the appropriated fund issue, we

. . . each of the AFCOMS programs underway is designed with the objective of better service to the Air Force customer.

are committed to a substantial reduction in personnel during Fiscal Year 77," he admitted. "So, we are faced with the challenge of improving service to our patrons, providing them with a reasonable savings on their purchases, and at the same time, significantly reducing operating costs." He added that the best way to achieve this objective without degrading service is to take as many cuts as possible in the overhead functions which is one of the main reasons for stressing early implementation of the complex concept.

When he was queried about the other advantages of a centralized management system, he summarized these goals:

One, provide a highly trained and motivated work force to bring about technical assistance, supervision and expertise worldwide. "I cannot overemphasize the need for bringing in new, talented and aggressive individuals who can be trained to assume management jobs. So far, we have been fortunate to attract the best qualified people available."

Two, AFCOMS will establish operation and performance standards and then measure the performance of all the stores against those standards.

Three, AFCOMS will establish and implement an aggressive construction program, using standardized layouts and up-to-date merchandising techniques. "I am aware of the value in providing modern, attractively decorated facilities conducive to convenient, pleasant shopping," he said. "In addition, the definite advantages of a new store such as increased efficiency, a larger stock assortment and customer convenience, all mean additional sales."

Digressing somewhat, General Burkett pointed out that sales represents the best measure AFCOMS has of customer satisfaction. "Sales for the past year ap-

proximated $1.3 billion," he said. "When you figure that's at cost, it represents a significant amount by any standard. Obviously, the commissaries have been doing a lot of things right.

"I do not intend to let that sales base slip," he said. "I have every hope that through better management, better inventory control, better in-stock positions and better facilities, we can improve sales. This will not only serve as an indicator that we are providing good service to the customers, but if we ever have to become self-sustaining, it will be important to spread our overhead costs over as broad a sales base as possible."

In line with this objective, General Burkett said AFCOMS will be paying particular attention to such things as inventory control, item selection based on better consumption data, and improved merchandising concepts. "Good application practices in these areas should result in increased sales," he said.

Returning to his discussion on the advantages of a centralized system, General Burkett said AFCOMS intends to implement a training and career development system that is designed to achieve a motivated and qualified work force.

And finally, he said that AFCOMS now serves as the single contact element for industry and commercial firms that are doing business with the commissaries. "We can talk to industry now as a single voice and benefit from their support for our different systems," he said.

In describing all of these management approaches, General Burkett was quick to point out that each of the AFCOMS programs underway is designed with the objective of better service to the Air Force customer.

"Much of what has been said may sound like the typical motherhood statements that can be expected from a new organization," he confessed. "However, we do have a dedicated staff within AFCOMS with expertise in financial management, facilities planning, systems development, personnel, training and commissary operations. I am confident that we can do the job."

In commenting on the immediate future, General Burkett said AFCOMS does not have all the answers as yet but it is actively exploring every avenue that offers a more cost effective and cost efficient operation. "As we determine the ways that will provide additional cost benefits, we will immediately implement those within our authority," he said.

The Commander is a Customer, too...

As the interview drew to a close, General Burkett requested from the **Quarterly** that the following comments be included in this write-up, saying his remarks are especially geared to the clientele who read this publication.

"I do not feel that the services officer is out of the picture now. I want him to still take an interest in the commissary store. It's going to take the cooperation and the support of a number of people to continue the commissaries as really efficient organizations. Therefore, I would hope that the base commander and the services officer will show a continuing interest in the commissary, walk in, see how things look and let us know anytime that they think the service is not what it should be.

"I know that they do not have a direct line of responsibility now; however, the store is still on their base and it's still a support function. I solicit their support and interest.

"As I mentioned previously, it may sound like motherhood, but the idea of a centralized vertical management structure is to create greater efficiency in the commissary store and improve the service to customers. This is exactly what we intend to do." E&S

Requiem for An Engineer (cont'd.)

As a result of a USAF-directed reorganization, he was later designated as Deputy Chief of Staff for Engineering and Services. In February of this year, he was promoted to the rank of major general.

Throughout his career, regardless of the position he was serving in, General Barnes never lost his respect or admiration for the problems of those engineers who work at the base level. Once during an interview with this publication, he remarked candidly, "I have served the whole gamut, and in looking back, I believe it is the Base Civil Engineer with whom we should be concerned. We have given him new management systems and . . . it is time we start giving him help.

"The most interesting aspect of my career occurred during my assignments at the base level," he said. "I soon learned that every man who works for you is an individual. It is this realization that matures the engineer-officer."

This can be said to be the true measure of General Barnes.

He will be missed.

"It was unusually close and still that night. In town, dogs were uneasy and barking fitfully. Suddenly, the earth began vibrating . . ."

EARTH

by Lt Col Arthur P. Hahn, RA, PE

Here is a vivid account of the days immediately following the night of 6 May 1976 and how Air Force engineers responded to a "disaster without parallel" in northern Italy.

The word in Italian sounds strange: "terremoto" (terry-moto). Its meaning in English — "earthquake" — needs no definition. To the people in the beautiful Friuli Region of northern Italy, the terremoto of 6 May 1976 was a disaster without parallel. The statistics give an order of magnitude. The area mainly affected is about 20 miles in diameter. Almost 1,000 were killed; 2,000 were injured; 42,000 left homeless; and over 85 percent of the remaining buildings were unsafe for occupancy.

Historians report an earthquake struck the area in the 1500s. Although floods and other natural disasters have occurred in nearly every generation, there are no subsequent reports of earthquakes since that century. Man-made catastrophes have happened all too frequently with wars swirling across the Friuli since Roman times. The gaps through the Alps have always been inviting openings for armies to pass between Austria and Italy. However, the people are resilient and had fully restored the area from the last damage of the World Wars into a beautiful, tranquil land of scenic villages, orchards and vineyards in a "Pre-Alps" mountainous setting.

In the Friuli, the spring night of 6 May was welcomed at Aviano AB. A squadron of aircraft of the Iowa ANG had just arrived from the United States and would be with us for several weeks. The weather indicated good flying conditions the next day. I was with three military electricians working late that night, in one of the hangars, running electric power to a piece of equipment supporting the aircraft. No one was complaining. It was a typical "BCE panic job," but a necessary one. Looking back, we recall it was unusually close and still that night. In town, dogs were uneasy and barking fitfully. Something seemed in the air.

Suddenly the hangar floor began vibrating and the lights flickered. It took us only an instant to get outside. By then, all electric power was off. The electricians raced for a vault across the street to tend to the generator which was kicking on and off, switch-gear apparently jostled by the quake, while I ran to the Base Command Post only a few hundred meters from the hangar. My first thoughts were of communication with the rest of the world.

Within minutes we had stable generator power and, miraculously, observation revealed no apparent damage to the airfield, key structures or utilities. Civil engineers began reporting to the shop areas without resort to a recall. Everyone sensed there was big trouble nearby and we immediately began to take stock of the situation. Our Damage Assessment Teams covered the base and reverified: no problems. However, the Italian radio reported heavy damage and loss of life in many nearby communities, some as close as a 10 minute drive from the base.

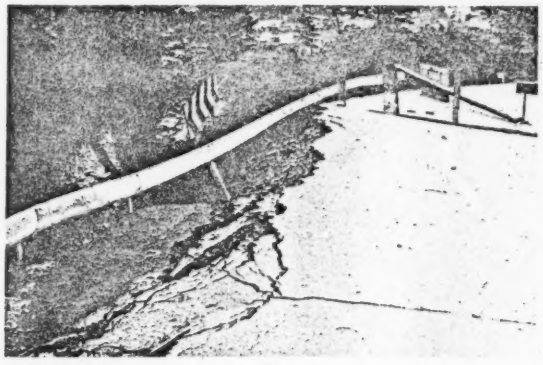
We reviewed our manning and prepared our equipment in case Italian authorities requested our assistance. The base didn't have long to wait. By midnight, medical aid was requested and dispatched to the disaster area. Working through the night, an Air Force hospital team tended injured, finally setting up an aid station in the town of Forgaria, about an hour's drive from Aviano AB.

Help was needed everywhere in the earthquake zone. We asked for and received permission to assist with the recovery efforts in Forgaria since the medical

QUAKE

What had been a picturesque three story stucco and brick building in Forgaria, Italy, was destroyed, its rubble partially blocking the street.

Affects of an earthslide undermined a highway leading into the town. Access was reopened by 40th Tac Gp engineers.



The Deputy Chief of O&M, 40th Tactical Group, Aviano AB, explains the work plan to Forgaria townspeople.

team had been there, and the base had dispatched a civil engineering damage assessment team to that area on 7 May.

Forgaria is, in reality, a community of villages connected by steep mountain roads. The largest town is Forgaria (population 600), with Cornino, San Rocco, Flagogna and Monte Prat located in the surrounding hills. A mayor and town council manage community affairs and have local jurisdiction. Outside the town limits, the Province of Udine is the controlling authority. These officials, through the Italian mili-

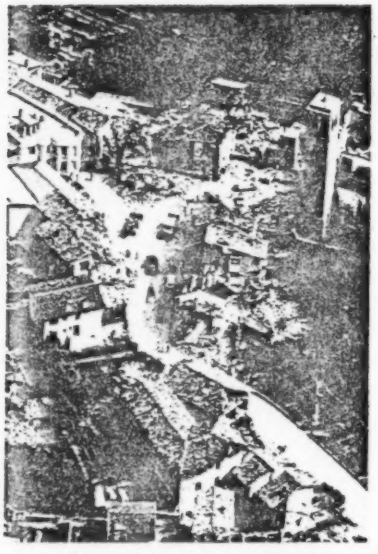
tary, asked the US Government for help.

Coordination was effected with USAFE DCS/Engineering and Services so that vital base recovery would not be jeopardized. The Base Disaster Preparedness Center was activated and served as a daily link between the field unit, home base and higher headquarters.

Deployment of US Forces came on Sunday, 9 May, after details were worked out between the US State Department and the Italian authorities. A convoy of 25 vehicles and approximately 100 personnel, snaked out of Aviano AB for Forgaria in the early morning hours of 9 May.

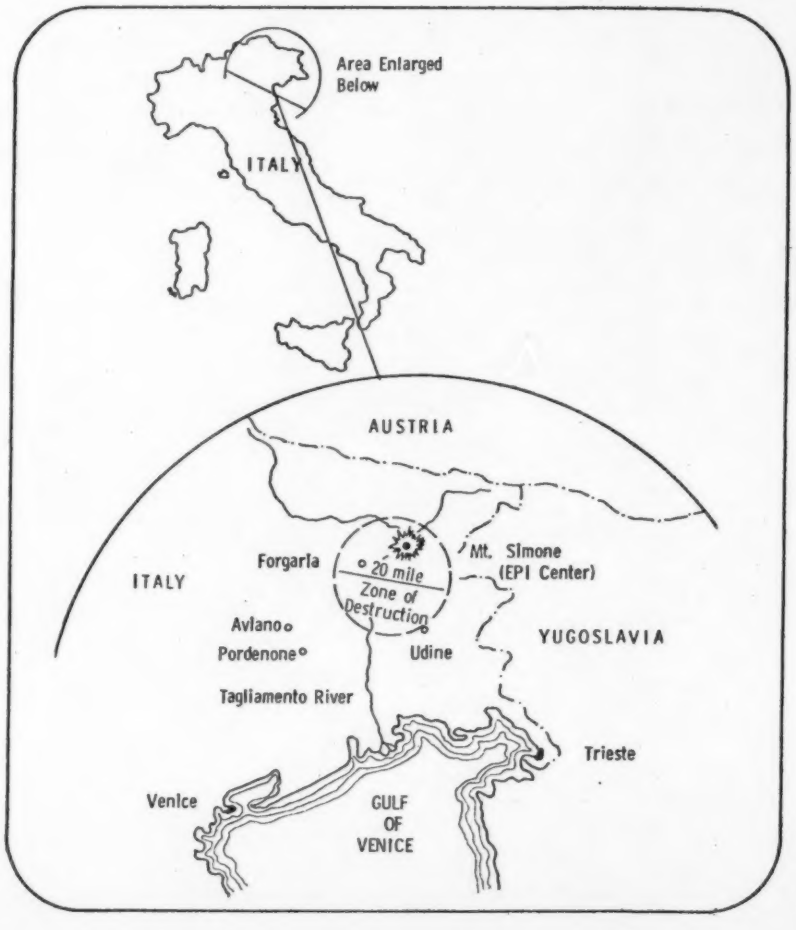
Principal Air Force recovery efforts were centered in the town of Forgaria itself. Streets were cleared and widened, access to the town was established and maintained, debris from demolished buildings was loaded and carried away to dump locations and clogged storm drainage systems were opened.

Nearly all buildings were destroyed. The primary reason for such a massive collapse of structures was evident. Most roof systems consisted of heavy tiles supported by large timbers fastened with hand-forged spikes. This loosely fastened system rested on stone walls. The structural system not only collapsed easily under the earth's movement, but caused problems in loading out debris. The heavy timbers, each weighing several hundred pounds, had to be muscled out of the wreckage to allow efficient front-end loader operation. The stone walls were held together with a



An overhead view of the main square in Forgaria shows the impact of the destruction. Civil Engineers of the 40th Tac Gp are clearing debris.

Map at the right shows the 20-mile zone of destruction of the quake.



soil-like mortar which crumbled in the hand. Therefore, even massive walls could be easily jarred loose. Buildings constructed in the past few years stood virtually undamaged amid the complete destruction of the old buildings. Lesson to be learned: good construction practice and methods are a major factor in building survival.

Much time was spent opening the road system interconnecting the villages. We worked with the Udine Provincial Highway Department. Landslides dislodged huge boulders, some as big as 15 feet in diameter. These boulders, and smaller rocks, cascaded down the mountains, crashing through bridges and buildings, bouncing off of highways, leaving craters in the surface and often completely blocking the roads. Bulldozers and front-end loaders were ideal for quickly opening this highway system. However, heavy rains in mid-month caused us to redo much of the work when additional slides occurred. Within sight of the epicenter, Mt. Simone, we worked nearly a week clearing a mammoth rock slide, estimated at over 7,000 cubic yards, thus opening a vital road link between towns.

Working hand-in-hand with the equipment operators were labor crews who recovered belongings, cut reinforcing steel and removed timber. Buried cars, clothing, furniture, appliances and family mementos were among the items saved. In addition, several stakebed trucks were busy hauling furniture from condemned homes. As Mr Gerometta, our Deputy Chief of O&M and a native of northern Italy, so aptly put it: "Please save as much as you can. When you've lost everything, even a nail is important." The labor crews earned the respect and admiration of the Italian population. They were sensitive to the peoples' desires and always took the time to search and go slow if there were any chance of recovery. Significant articles, such as municipal records going back hundreds of years and the

A townswoman of Forgaria, Italy, surveys what is left of her home.

sash of office, worn by the mayors of Forgaria for the past 30 years, were recovered amid the rubble. Later, an emotional event occurred when the Mayor presented this sash of office to the Aviano AB Commander as a token of appreciation and friendship on the last day of operations.

Safety was a watchword and it paid off. Within 22 work days, more than 19,000 tons of debris were moved and over 15 miles of roads opened and maintained, by 50 to 100 personnel working daily. Nothing more serious than a cut finger was reported and only minor body damage was sustained to equipment. The drivers and spotters were always on their toes and the vehicle maintenance crews were instantly on the scene in case of mechanical problems.

After a month of hard, dirty, but tremendously satisfying work, the 40th Civil Engineers withdrew on 6 June from Forgaria at the direction of the US Disaster Relief Commander. This action coincided with the withdrawal of the Army's 509th Special Forces Engineer Platoon which was working in Osoppo, Italy, a nearby town. The short ceremony that took place on the sunny Saturday morning of 6 June was heartwarming. Tears were in many of the townspeoples' eyes, tokens of friendship were exchanged, words of gratitude and encouragement were expressed. It was a time to be proud to be an Air Force Civil Engineer.

Where we had worked, Italian civilian heavy equipment now took over. It will be a long, hard job to rebuild and to replace hundreds of years of tradition and beauty. But those of us who were there, and know the people, their strong will to continue, have no doubt that they will echo our motto: "Can do — Will do."

E&S

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Short tours in civil engineering and services have been reduced by over 75 percent. At present, there are 71 tours available to engineers and 10 for services officers. Locations, how an officer is chosen and other related information have been compiled by the Military Personnel Center, providing officers with the opportunity to better plan their careers.

Remote Assignments: On the Decline

by Maj Richard L. Brown

Short tour (often called remote) assignments have long been a career irritant and have been of great concern to all engineering and services officers in their career planning. The total number of short tours in civil engineering and services today have been reduced by over 75 percent since the height of the Vietnam conflict. The number may be reduced even more if a study, now being considered, is approved to convert the majority of the Alaskan sites to contract operations. Present short tours total 71 for civil engineering and 10 for services.

In the past, an officer could expect two "remotes" in a career, but with the decline of short tours in the last five years this figure has been reduced. The majority of civil engineering officers coming on active duty today and some already in service will probably have only one short tour and some services officers may have none. These figures represent "today's mission" and are subject to change if there is another contingency such as Vietnam.

Location of Short Tours

The remaining short tours are shown in **Figure 1** by country and rank. In Korea, Taiwan and Iceland, availability of family quarters and dependent support facilities is severely limited. Therefore, command sponsorship can be granted to only a limited number of families. Such tours are normally authorized for members assigned to MAAGs and certain key positions in other special manned organizations.

The chances of going short after an officer makes major are greatly reduced and will continue to decline as he progresses higher in rank. Even a company grade officer's chances are reduced with the deletion of company grade short tour authorizations. These changes will result in some officers not going on a short tour until they make captain or major, depending upon their earlier assignments. In fact, we are now able to select more company grade officers for accompanied oversea tours to areas such as Europe, Alaska or the Pacific area prior to serving a short tour.

Figure 1: Short Tours by Country and Rank.

Country	Col	LtC	Maj	Capt	Lt	Total
Alaska			1	15	1(3)	17(3)
Canada				1		1
Greenland		1	1	3(1)		5(1)
Iceland			1	2		3
Johnston Island			1			1
Korea	1	3(1)	11(3)	12(1)	10(1)	37(6)
Saudia Arabia		1	3			4
Taiwan				1		1
Turkey				1		1
Wake Island			1			1
Total Short Tours	1	5(1)	19(3)	35(2)	11(4)	71(10)

( ) Services Officers

All of the tour locations listed in **Figure 1** and **Figure 2** represent short tours of 12 months if taken unaccompanied. If an officer is authorized and elects to take one of these tours as an accompanied-by-dependents tour (24 month tour), he does not receive short tour credit and remains eligible for a short tour when he returns to the CONUS.

Short Tour Selection Procedure

It is Air Force policy to send qualified volunteers on all oversea assignments prior to selecting any nonvolunteers. When there are no qualified volunteers, the Short Tour Return Date (STRD) roster is used to select a nonvolunteer. An officer's position on this roster is determined by rank, AFSC, time since last remote, number of remotes and date of last oversea tour of any type. If an officer has never been on a short, his STRD is the time he entered active duty. A short tour performed as an enlisted man or performed in another career

Figure 2: Listing of All Short Tours by Sites.

Base	MAJCOM	Auth Grd	AFSC	Projected Rotation	Tour Length	Duty Title
ALASKA						
Campion	AAC	Capt	5525G	7804	12	Station Civil Engineer
Cape Lisburne	AAC	Capt	5525G	7801	12	Civil Engineering Officer
Cape Newenham	AAC	Capt	5525G	7710	12	Site Civil Engineer
Cape Romanzof	AAC	Capt	5525G	7803	12	Civil Engineer
Clear	ADC	Capt	5525C	7804	12	Civil Engineer
Cold Bay	AAC	Capt	5525G	7705	12	Site Civil Engineer
Fort Yukon	AAC	1Lt	5525G	7712	12	Station Engineer
Galena	AAC	Capt	5525G	7707	12	Civil Engineer
Galena	AAC	1Lt	6224	7705	12	Chief Services
Indian Mountain	AAC	Capt	5525G	7802	12	Site Engineer
King Salmon	AAC	Capt	5525G	7709	12	Station Civil Engineer
King Salmon	AAC	1Lt	6224	7707	12	Chief Services
Kotzebue	AAC	Capt	5525G	7803	12	Station Civil Engineer
Murphy Dome	AAC	Capt	5525G	7709	12	Station Civil Engineer
Shemya	AAC	Maj	5516	7707	12	Civil Engineer
Shemya	AAC	Capt	5525C	7804	12	Station Civil Engineer
Shemya	AAC	1Lt	6224	7709	12	Chief Services
Sparrevohn	AAC	Capt	5525G	7711	12	Civil Engineer
Tatalina	AAC	Capt	5525G	7706	12	Station Civil Engineer
Tin City	AAC	Capt	5525G	7712	12	Station Civil Engineer
CANADA						
Cape Parry	ADC	Capt	5525C	7712	12	MAJCOM Contract Monitor
GREENLAND						
Sondrestrom	ADC	Maj	5516	7802	12	Director Civil Engineering Division
Thule (4683 ABSGp)	ADC	LtC	5516	7808	12	Director of Civil Engineering
Thule (4683 ABSGp)	ADC	Capt	5525G	7801	12	Chief of O&M Branch
Thule (4683 ABSGp)	ADC	Capt	5525G	7712	12	Chief of Engineering Branch
Thule (12MIWSq)	ADC	Capt	5525G	7708	12	Civil Engineering Officer
Thule	ADC	Capt	6224	7705	12	Chief Services
ICELAND						
Hofn	ADC	Capt	5525F	7804	12	Flight Civil Engineer Officer
Keflavik	ADC	Capt	5525C	7708	24/12	Staff Civil Engineer
Keflavik	HQM	Maj	5516	7807	24/12	Staff Officer
JOHNSTON ATOLL	HQM	Maj	5516	7807	12	DOD OIC Civil Engineering
KOREA						
Kunsan	PACAF	LtC	A5516	7807	24/12	Sq Cmdr and BCE
Kunsan	PACAF	Maj	5516	7707	24/12	Deputy BCE
Kunsan	PACAF	Maj	5516	7802	24/12	Chief O&M
Kunsan	PACAF	Capt	5525C	7711	24/12	Engineering & Construction
Kunsan	PACAF	Capt	5525C	7702	24/12	Chief of Programs
Kunsan	PACAF	1Lt	5525D	7801	24/12	Chief Industrial Engineer
Kunsan	PACAF	1Lt	5525A	7712	24/12	Base Architect
Kunsan	PACAF	1Lt	5525E	7711	24/12	Elect Engineer
Kunsan (RED HORSE)	PACAF	Maj	5525G	7801	24/12	Det Commander
Kunsan (RED HORSE)	PACAF	Capt	5525F	7708	24/12	Engineering
Kunsan	PACAF	Maj	6216	7707	24/12	Chief Services
Kunsan	PACAF	1Lt	6244	7803	24/12	Food Service Officer
Kwang Ju	PACAF	Capt	5525G	7712	24/12	Civil Engineer
Osan	PACAF	LtC	5516	7707	24/12	Deputy BCE
Osan	PACAF	Maj	5525G	7704	24/12	Chief of Programs
Osan	PACAF	Maj	5516	7711	24/12	Chief O&M
Osan	PACAF	Maj	5525G	7708	24/12	Chief E&C
Osan	PACAF	Capt	5525C	7707	24/12	Chief, Engrg Design Section
Osan	PACAF	Capt	5525F	7712	24/12	Mechanical Engineer
Osan	PACAF	Capt	5525C	7706	24/12	Chief, Constr Management
Osan	PACAF	Capt	5525G	7801	24/12	Construction Management
Osan	PACAF	Capt	5525E	7708	24/12	Programming Officer
Osan	PACAF	Capt	5525F	7803	24/12	Programming Officer
Osan	PACAF	Capt	5525C	7704	24/12	Chief Program Development

(Cont'd on next page)

Base	MAJCOM	Auth Grd	AFSC	Projected Rotation	Tour Length	Duty Title
Osan	PACAF	1Lt	5525D	7705	24/12	Chief Industrial Engineering
Osan	PACAF	1Lt	5525E	7706	24/12	Electrical Engineer
Osan (RED HORSE)	PACAF	LtC	5516	7706	24/12	Deputy Commander
Osan (RED HORSE)	PACAF	Maj	5525C	7705	24/12	Operations
Osan (RED HORSE)	PACAF	Maj	5525G	7706	24/12	Chief, Airfields & Cantonments
Osan (RED HORSE)	PACAF	1Lt	5525A	7706	24/12	Chief, Architectual Branch
Osan (RED HORSE)	PACAF	1Lt	5525C	7709	24/12	Civil Engineering Officer
Osan (RED HORSE)	PACAF	1Lt	5525E	7712	24/12	Commander Det 8
Osan (RED HORSE)	PACAF	1Lt	5525F	7709	24/12	Chief Mechanical Branch
Osan (RED HORSE)	PACAF	1Lt	5525G	7707	24/12	Operations Officer
Osan	PACAF	Maj	6216	7707	24/12	Chief Services
Osan	PACAF	Capt	6244	7711	24/12	Food Services Officer
Seoul	HQM	LtC	6216	7709	24/12	Dep Commander, KRE
Taegu	PACAF	Capt	5525C	7708	24/12	Civil Engineer
Yong San Cty	HQM	Maj	5516	7707	24/12	DOD Staff Civil Engineer
Yong San Resvn	HQM	Maj	5516	7806	24/12	Jt Plans and Operations Officer
Yong San Resvn	HQM	Maj	5516	7806	24/12	Civil Engineering Officer
Yong San Resvn	HQM	Maj	6216	7708	24/12	Services Staff Officer
SAUDIA ARABIA						
Alkhobar Adm Aux	AFLC	LtC	5516	7807	18/12	Civil Engineering Staff Officer
Daahran	AFLC	Maj	5516	7704	18/12	OL Resident Engineer
Khamis Mushayt	AFLC	Maj	5516	7802	18/12	OL Resident Engineer
Taif	AFLC	Maj	5516	7706	18/12	Resident Engineer
TAIWAN						
Ching Chuan Kang	PACAF	Capt	5525G	7711	24/12	Civil Engineer
TURKEY						
Diyarbakir	USAFE	Capt	5525G	7711	12	Civil Engineer
WAKE ISLAND	PACAF	Maj	A5516	7704	12	Commander

field gives the officer short tour credit and he will not go again until all other officers of his rank and AFSC have completed a remote.

In some cases, an officer who is the most STRD eligible will not be selected because his or her qualifications or experience are not sufficient to fill the projected requirement. Officers will not be selected for a short tour unless they meet the person/job match. The STRD roster is used only to select officers for the locations shown in **Figure 2.**

The Officers Assignment Regulation, **AFR 36-20,** provides the basic requirements for all oversea assignments. A short tour as defined in that regulation is an unaccompanied tour of from 12 to 15 months.

Provisions for selecting an officer for a short tour are outlined in detail in **AFR 36-20;** but the basic procedures are as follows: When the duty location does not authorize an accompanied-by-dependents or the all-others tour is less than 15 months, **Figure 2,** and there are no volunteers, officers are then selected from the STRD roster.

Figure 3 lists those locations where the "all-others" tour length is 15 months. An officer receives short tour credit for an assignment to one of these locations if he or she takes it unaccompanied. However, as of May 1976, 24/15 month tour selection has been from the long oversea roster which is based on the date returned from last oversea assignment whether it was short or long. This change to the regulation has further reduced the number of officers selected due to short tour eligibility. With an option to take the tour accompanied, the majority of the officers were electing the 24 month accompanied-by-dependents tour; however, these individuals did not receive short tour credit. Thus, the primary reason for this policy change was to make the selection procedure more compatible with the eventual tour election. Upon completion of the 24 month assignment, officers were returned to the CONUS and a year later would again be eligible for a short tour. An officer could end up with four moves within three to four years, while if he had taken the initial assignment unaccompanied, he would have had only two moves. Also, an officer could have returned from overseas just a year ago and could get picked up for a short tour due to his STRD date.

Follow-On Assignment

Today an officer going on a 12 month or 15 month unaccompanied tour is provided, if he desires, a follow-on assignment from his short tour prior to departing for overseas. Assignments are made consistent with Air Force needs, an officer's aspirations, career programs and costs. This includes an

Figure 3: 24 and 15 Month Tours.

Country	Col	LtC	Maj	Capt	Lt	Total
Australia			1			1
Azores		1	1	1	1	4
Guam	1	1(1)	1	4	3(2)	10(3)
Philippines	1	3(2)	4(3)	3	3(2)	14(7)
Taiwan			2	2	2(1)	6(1)
Turkey		2	3(1)	3	(2)	8(3)
Total 24/15 Month Tours	2	7(3)	12(4)	13	9(7)	43(14)

( ) Services Officers

assignment to a consecutive oversea tour (COT) or to a projected vacancy in the CONUS. One reason for follow-on assignments is to conserve funds by reducing the number of designated moves or interim moves for dependents and corresponding household goods, transportation and storage costs. Officers are encouraged to consider leaving dependents at the current duty station, in family housing where authorized, or moving them to the follow-on location within the CONUS while serving a short tour.

If an officer desires, the first consideration for a follow-on would be to return to a projected vacancy in the area in which he is currently stationed. However, with unpredictable changing requirements and the fact that we will be looking at projected vacancies approximately 18 months in advance from a short tour selection date, this may not be practical. Since we are working 18 months in advance, some assignments may have to be changed or cancelled, but deviations will be minimized to the best of our abilities. If we have to change an officer's follow-on assignment, we will work with him on any change. The easiest assignment to predict is the COT assignment because of the controlled oversea return dates. But again these are subject to change if the incumbent extends or is curtailed for some reason. Also, an officer may be selected for Air Force Institute of Technology (AFIT) prior to his departure to, or return from, a short tour if he has a letter of eligibility and is otherwise qualified and selected by the AFIT selection board.

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Hopefully, this information about short tours, policy and procedures gives each officer a better understanding of remote tours and their locations. We desire to keep family separations to a minimum; but in order to meet mission requirements short tours are necessary. If and when an officer is selected for a short tour, depends a lot on him and his career plans. Some officers see a short tour as a springboard to accelerating their career progression, especially with the present emphasis on conserving PCS funds which has virtually eliminated CONUS to CONUS moves. By going remote, an officer is able to move toward his desired career objectives at an earlier date, whether it be an assignment to AFIT, to a controlled tour on a major command staff, to the Air Staff or to a long oversea assignment. An officer should remember that once he is within a year of being "remote" eligible, he cannot be placed on a controlled assignment.

Presently, we are selecting engineering nonvolunteers with STRD's as follows: Civil Engineers—lieutenant colonels 1967 and 1968; majors 1967 and 1968; and approximately three to four years in service for company grade officers. Most of our engineering assignments are filled by volunteers and almost all of our services remotes are filled by volunteers. If you are interested in volunteering for any of the short tours or all-others tours listed in Figure 2, annotate this on your AF Form 90. Call PALACE BLUEPRINT if you desire additional information. E&S

JSCERDCG Establishes Subcommittee

The Joint Services Civil Engineering Research and Development Coordinating Group (JSCERDCG) established the Facilities Energy Subcommittee at its recent meeting held 22-23 September at the Air Force Civil Engineering Center (AFCEC) at Tyndall AFB, Florida. The work of the subcommittee is to plan and coordinate installation-related energy research and development efforts of all the services toward the common goal of achieving energy self-sufficiency for remote military installations.

Such cooperation should provide the means for exchange of technical expertise at the working level, thereby complementing individual service efforts, but avoiding unnecessary duplication. The first report of the subcommittee will address future programmed efforts.

For further information, contact the chairman, Lt Col Sterling E. Schultz, AFCEC/DE, AUTOVON 970-2687.

TOWARD FLEXIBLE DEFINITIVE DESIGNS

Today's world is changing so fast that we simply cannot afford to design facilities that cannot respond to changes in use at minimum cost. Design concepts aimed at accommodating multiple functions over time are needed to stem the rising costs of base operations.

by Capt Michael J. Burrill, RA, AIP

Definitive designs permit the "worldwide development of identical or nearly identical buildings."

AFM 88-2, para 2e, 1975.

"When the criteria permits latitude, the Air Force does not generally attempt to direct closely the designer's solution to the problem. It is preferable to use the technical skill and resourcefulness of a professional designer, uninhibited by excessive direction."

AFR 89-1, para 2-3a(2), 1975.

Explicit directives form the backbone of Air Force "systems." Without them, people and machines will not move, supplies will not flow, wars will not be won. General guidance may not motivate men enough to face danger when the chips are down; commanders cannot afford to discuss pros and cons of directives when speed alone may make the difference between life and death. It's a paradox of democratic societies that their military elements must set limits to freedom and creative thinking to preserve freedom for the society at large.

This dichotomy between explicit directives and general guidance permeates published Air Force directives, generating attitudes of unquestioned compliance as well as a framework for innovation. Both are needed to keep the Air Force running. **Explicit directives make sense when time is short or there's really only one way to do something. General guidance is appropriate when objectives are clear but solutions are not, or when a good way to do something is not necessarily the only good way.**

The distinction between mandatory requirements and optional procedures is clearly spelled out in only one Engineering & Services regulation **(AFR 85-1)**. Unfortunately, some general guidance is written in imperative tones in the hope it will be interpreted as a directive, and some established controls that aren't really necessary. The danger inherent in excessive control is twofold: You may create an atmosphere that discourages creative thinking, or you may simply create so much guidance that it's impossible to read it all or discern what's really important. Setting controls at an appropriate level involves making accurate judgments about the capability of the work force in the field to think creatively without explicit direction. Nowhere is this task more difficult than in the subjective area of design policy.

The Definitive Design Manual, **AFM 88-2**, which serves as the focus for this article, provides explicit direction through pictures instead of words. This manual, together with several related design policy directives, tells designers how to design buildings, even though designers presumably rank among the world's most creative people. **AFM 88-2** deserves close review, since it sets design policy that has affected the lives of millions to date. It's based on the reasonable premise that policy guidance in design is just as necessary as guidance in management or base operations. The question is, where do you draw the line between **policy** and **procedure**? Or, in this case, between design **objectives** and design **solutions**?

Here's where current definitive designs fail us. Although **AFR 89-1** clearly proposes definitives that "diagrammatically delineate the total space" and "functional layout" of buildings, most current definitives are not diagrammatic in nature and imply that only one basic floor plan will meet functional requirements. Their precise dimensions suggest they should be interpreted as a blueprint for preparing working drawings with minimum change.

Creative designers recoil from the prospect of de-

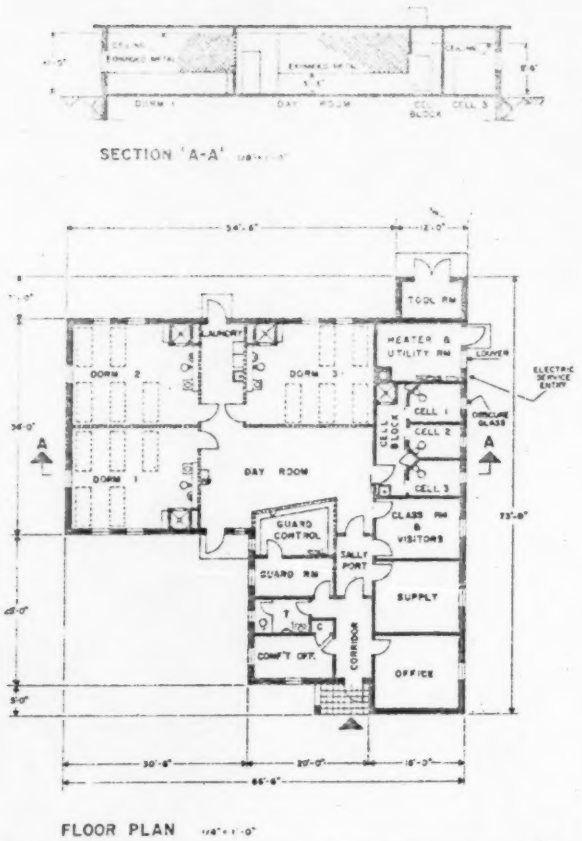
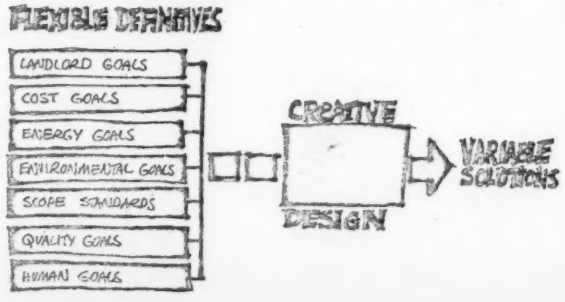


Figure 1: Current Definitives: Precise dimensions dictate design solutions.

veloping "exterior treatment" for a building with fixed shape and room arrangement, or trying to fit such buildings on sites that almost always demand a different relationship between interior and exterior spaces. We also suspect the well-intended idea that definitives yield "substantial savings in design and construction costs" can't be supported. Initial savings, if any, have been offset by the long range costs impact of current definitives in terms of land use, the environment, energy and life-cycle costs.

Figure 2: The basic issue is whether design objectives can be "standardized."



But the basic issue is whether design objectives can be "standardized" sufficiently to insure comparable scope and quality without imposing standard design solutions intended to generate "the worldwide development of identical or nearly-identical buildings." Our first response is emotional in nature: **If people are forced to live and work for 20 years in monotonous, look-alike buildings, they will lose their sense of individual identity.** People do not discard their natural human desire for meaningful variety upon donning a uniform. But regardless of the strength of emotional arguments for variety, practical minds demand a more reasoned response: **Flexible design standards are essential for the Air Force to keep pace with changes in high technology and human needs in the next 25 years.**

Actually, flexible design standards have already begun to emerge. For example, the bubble diagrams incorporated in the new definitive for Judge Advocate facilities suggest desirable functional relationships without dictating a specific design solution. Although many designers feel bubble diagrams are too vague to clearly

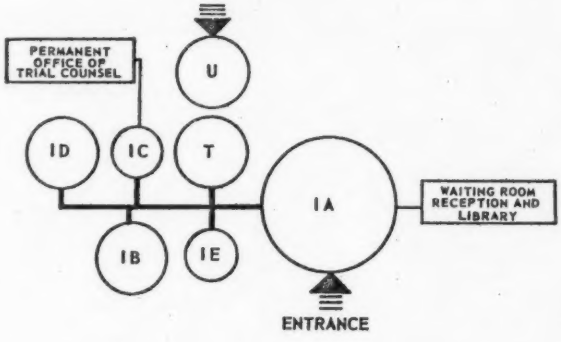


Figure 3: Diagrammatic Definitives: Establishing design goals instead of solutions.

convey design objectives, they aren't intended to be as specific as a floor plan. While they restrict design options more than a simple list of rooms or functional areas, more than one floor plan will satisfy functional requirements implied in a single bubble diagram. The design standards used in turnkey housing programs also generated varied solutions (see "Good Housing for Unknown Clients," May 1975, **Air Force Civil Engineer**). But the case for flexibility can be expanded much further, and this demands a close look at our basic design objectives.

Objectives: The Air Force as User and Landlord

AFM 88-2 identifies five objectives of the definitive drawing system:

- Improves understanding of user operations and guidance;
- Establishes continuity in design standards and policy;
- Expedites programming;

- Provides substantial savings in design and construction costs;
- Simplifies operations and facility upgrading.

All of these objectives have in common the well-intended desire to improve mission accomplishment or save money; in other words, they relate to the Air Force as user and landlord. **None of the objectives are "people-related" in the sense of addressing the quality of base environments as a response to human needs.** But let's examine whether current definitives or more flexible standards would best accomplish these objectives.

The process of developing definitive designs does bring using organizations and an interdisciplinary design team together, and their analysis of design standards and functional relationships may improve their understanding of the user's operation and guidance. But you don't need to develop a design **solution** to achieve this objective. Standard design solutions actually encourage users at MAJCOM and base level to overlook how local space requirements may suggest major modifications to definitives or entirely different designs. **This "local input" to design requirements is the most important phase of programming and concept design and would be encouraged by diagrammatic definitives.**

Current definitives achieve continuity in design standards and policy only if built without modification. **Diagrammatic definitives would establish standardized criteria and objectives without imposing standardized designs.**

Current definitives expedite programming only if changes are minimized. Definitives convey what a "typical" facility can look like, which expedites understanding of specialized flight line functions not found in civilian life. But development of program documents takes longer if local space and functional requirements demand a different design solution, since deviations from definitives must be justified at all levels of command. Recognizing this, many designers attempt to follow definitives closely even if they don't provide the most desirable solution. Often, it would take less time to develop a completely different design appropriate for the site and local conditions. When definitives are or should be modified, savings in programming time disappear. **Changes in programming policy, combined with flexible definitives, would eliminate entirely the need to develop a concept design to determine project scope or obtain fund approval.**

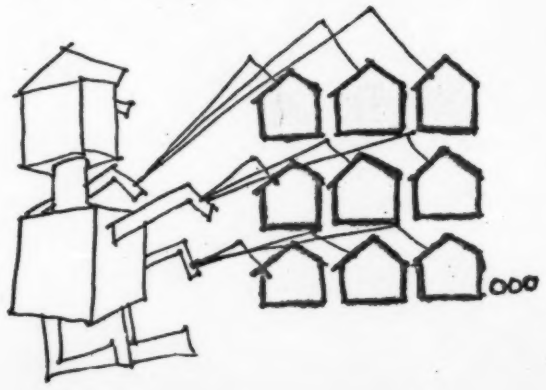
Current definitives provide substantial savings in design costs only if the concept design phase is reduced in scope or eliminated, and A-E fees reduced accordingly. This rarely occurs, since current definitives still require development of a site plan and "exterior treatment." Since working drawings constitute the greatest design effort, standardizing details and specifications or site-adapting a successful design would yield greater design savings than standardizing floor plans. **Flexible definitives, by contrast, would encourage comprehensive review of user requirements before design begins, reducing the possibility of costly design changes after A-E firms are under contract. Project books play a similar role now for major new facilities.**

Current definitives would reduce construction costs substantially only if similar designs were bid simultaneously in concentrated locations (the volume market theory) or if definitives were the most efficient, effective designs possible. Air Force bid experience with industrialized facilities and conventionally-built "standardized" designs indicates savings from standardization are rarely substantial and often offset by other factors. Since current definitives have an average design cost of about $750 per facility, it is unlikely they are the most efficient designs possible. **Flexible definitives would have far greater impact in reducing construction costs by encouraging comprehensive review of qualitative and quantitative decisions, such as scope and materials, that significantly affect project costs.**

Since the pros and cons of cost reduction arguments are highly theoretical, the best way to determine whether current definitives actually reduce design and construction costs would be to compare A-E fees and bids for comparable facilities designed both ways (based on definitives or special designs). Given a large enough sample and appropriate adjustments for differences in bid date, location, scope and quality, the results could be revealing.

Current definitives simplify operations management and facility upgrading only if built and maintained in use without modification. This objective assumes that the way people do their jobs can be "standardized" if facilities are also standardized, and that standardized operations are necessarily more productive. **Many theories of human behavior suggest the opposite is true — that humane working environments tailored to suit individual needs stimulate greater productivity.** Military personnel, after all, must be able to adapt readily to varying environments. Potential savings from "simpler" upgrading of "standard" facilities are minimal, especially as incremental changes are made to buildings over the years. **Flexible definitives would, by contrast, encourage the development of consolidated, multi-function facilities that can accommodate the variety of functions bases experience over time, significantly reducing the need for upgrading in future programs.**

Figure 4: The monotony of look-alike bases.



Objectives: Blending High Technology with Human Needs

Current definitives also have a significant impact in the more subjective and elusive areas of design: variety, land use, the environment, energy and life-cycle costs. Flexible definitives would encourage a greater response to human needs in these areas while simultaneously improving mission accomplishment and reducing costs.

The emotional desire for design variety has enormous practical repercussions. We would question whether the "worldwide development of identical or nearly identical facilities," **no matter how well designed,** would be desirable even if possible. **If all 145 major Air Force bases functioned and looked essentially alike, we might find that robots could operate them more efficiently than people.** The monotony of 20th century American cities has brought the desire for variety into sharp focus. Nor does variety have to cost more — meaningful variety stems from differences in functions, in contrast to artificial variety applied in gingerbread fashion to completed designs to "make them look better."

Nor does the concern for variety imply that all facilities should be different. The success of regional styling variations, such as Randolph AFB's Spanish architecture, does not preclude some "standardization" of functions (housing similar airplanes or other inanimate objects, for example). **The type of facility affects the degree of standardization desireable.** While one basic design may be suitable for some flight line facilities, variety is particularly important for "people" facilities such as housing, community support and administration/training facilities. Even where one basic design works well, greater variety in scope is needed. Although some definitives have as many as 18 different sizes, the average is less than three sizes for each facility and half have only one size. More important, size standards are typically based on troop strength rather than actual demand factors affecting space needs. **Flexible definitives would allow designers to respond to meaningful variations in existing conditions and functional requirements at each base.**

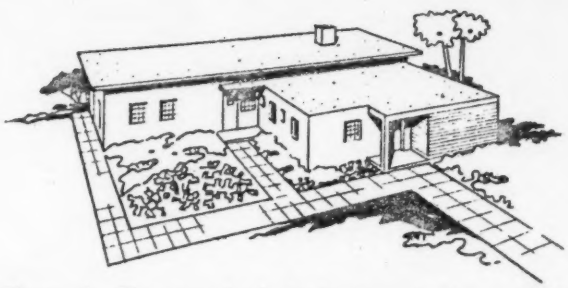
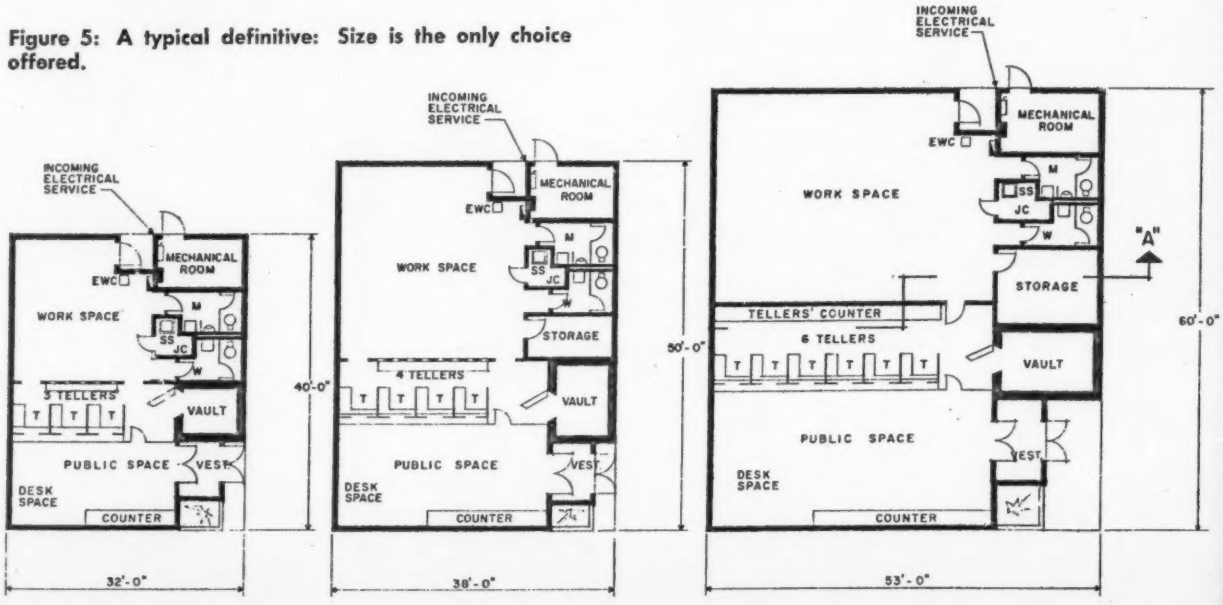


Figure 6: The sprawl of single-story structures. Will "gingerbread" really make them beautiful?

Land use presents a significant dilemma. Many bases are simply running out of land for new construction, providing an obvious practical and economic incentive to consolidate functions and re-cycle existing land wherever possible. At bases where land is still abundant, functional efficiency and life-cycle costs alone dictate a more comprehensive approach to land use and design.

Current definitives have accelerated the land-waste trend by emphasizing small, single-function, low-rise structures, creating on-base "suburban sprawl" that is not only inefficient to use but extremely costly to operate and maintain. Forty percent of the designs in **AFM 88-2** have less than 5,000 square feet of floor area and only 15 percent exceed 20,000 square feet; only 12 designs have two stories or more. This trend toward small facilities stems from the understandable desire to give each base organization its own "identity." It also simplifies design; it is much easier to design a facility to serve a single function than to serve several related functions.

Figure 5: A typical definitive: Size is the only choice offered.



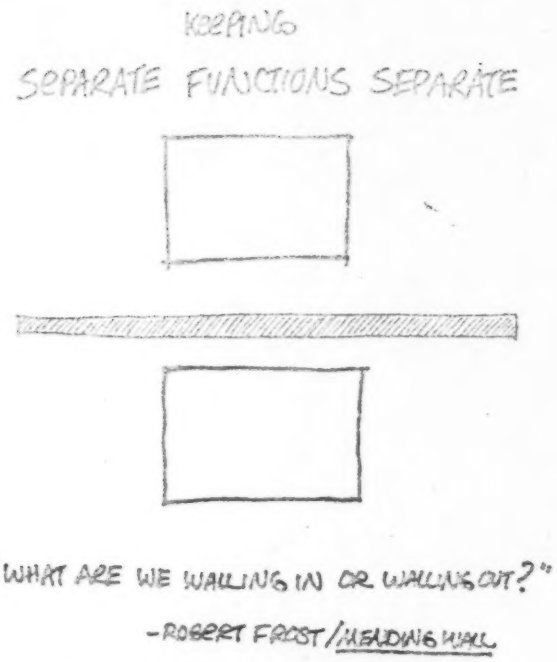


Figure 7: Keeping separate functions separate.

The Air Force can no longer afford to consider each base activity as a separate entity.

Comprehensive planning involves far more than finding the best site for a facility (the role traditionally assigned planners). **Instead, it implies taking a comprehensive look at existing base conditions to determine the most functional and cost effective means of relating functions and improving base environments.** This basic approach to planning, while suggesting an entirely new role for definitive designs, is not just a visionary ideal endorsed solely by planners. One message from the Office of the Chief of Staff, quoted here in part, stressed the advantages of consolidating functions:

"Consolidation and regionalization can produce material and manpower savings through elimination of duplicative functions, combination of like activities to assure most effective utilization of resources and skills, and exploitation of the principle of economy of scale . . . the approach is already being applied in the case of support aircraft, tactical and strategic airlift . . . computer services . . . procurement functions . . . centralized pay . . accounting . . . personnel administration and related techniques. Each command should conduct a detailed assessment to identify any potential for further savings using these techniques. Your examination should be unhampered by tradition, by considerations of status quo, or by standards of living we can no longer afford."

The principle of consolidation does not mean each base should become a miniature Pentagon, despite the Pentagon's success in accommodating 35,000 people efficiently. **A more powerful mandate to change facilities design policies which encourage separation of functions would be difficult to imagine.** From the perspective of the Air Force as a whole, this suggests a comprehensive analysis of existing and proposed use of facilities worldwide. At each base, planners, programmers and designers can assist commanders in identifying inefficient functional relationships that justify new construction, renovation or simply relocation of functions.

Air Force concern with the environmental impact of design alternatives has emerged primarily since 1970, after most current definitives were developed. Evaluating environmental impact involves an interdisciplinary approach to design which is simply not compatible with the present concept of definitives.

Environmental impact varies from site to site. A "standard" design that works in one location with minimum adverse impact may create a significant adverse impact at another site on another base, even if both bases "need" similar facilities. This difference in environmental impact may be due to physical difference in the site, such as its shape, size, ecology, topography, utilities, prevailing densities or proximity to other facilities. Or it may stem from broader concerns such as community attitudes, the local economy, regional design styles or land use controls. Almost always, it takes a **basic** design change to minimize adverse impact and generate a positive relationship between buildings and their surroundings. **Flexible definitives would allow designers to respond to meaningful variations in environmental impact.**

Energy is another primary Air Force concern. While current definitives reflect higher-than-average energy standards, they were not designed with energy conserva-

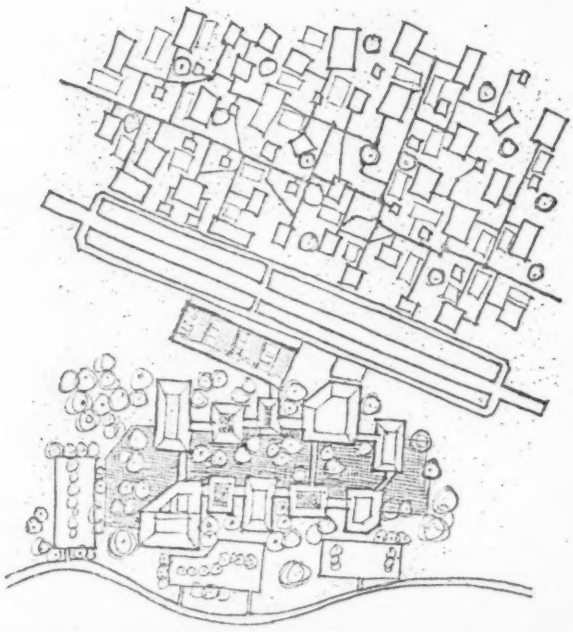
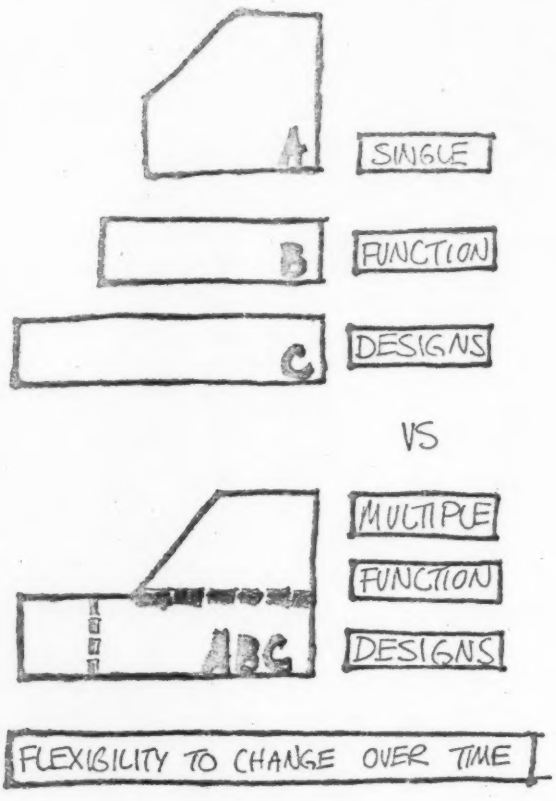


Figure 8: Suburban sprawl vs. consolidated functions: 25% less floor area to serve the same missions humanely.

Figure 9: Flexibility to change over time.



tion as a major design priority. Nor can any set of "standard" design solutions adequately respond to the current energy crisis.

Design for optimum conservation of energy and natural resources demands an individual design solution reflecting unique conditions at each site. "Prototype" design solutions with demanding energy-related standards have limited value. The "best" solution for a given site demands an understanding of the local microclimate; the effects of building orientation, shape, perimeter area, glazing, floor area, number of stories and common walls, and a host of other factors. Small single-story facilities such as current definitives use more energy per square foot than larger consolidated facilities, and of course, any reduction in space needs through consolidation also reduces energy consumption. **Flexible definitives would encourage energy-conscious design by establishing energy-performance goals appropriate for each function, instead of imposing standard solutions.** These goals could also be used as yardsticks to measure the performance of existing facilities.

Finally, what about life-cycle costs? Here's where diagrammatic definitives would have their most significant impact. Flexible design standards would encourage consolidation of related functions into a coordinated, energy-efficient complex that could accommodate existing base missions at far lower cost. A "what if" study of consolidating functions at one typical base indicated potential savings of 25 percent of total floor area and 15 percent of the annual base budget (see "Blending High Technology with Human Needs," November 1975, **Air Force Engineering & Services Quarterly**). Such savings are obvious and measurable. But lurking underneath are even greater costs associated with rigid design standards.

Today's future shock world is changing so fast we simply cannot afford to design facilities that cannot respond to changes in use at minimum cost. Year after year, millions of dollars are spent within DOD (and in civilian facilities as well) converting buildings from one use to another. The problem extends far beyond **AFM 88-2** to include all of the prescriptive standards and specifications in other Air Force and DOD design manuals. **Design concepts aimed at flexibility, at accommodating multiple functions over time, are desperately needed to stem rising costs of base operations.**

Summary: A Prototype Design Manual

What form, specifically, would a prototype design manual take? It would:

- Consolidate **all** design guidance for Air Force facilities in a single document.
- Combine narrative information for specific facilities with graphic information, presenting both together to eliminate cross references.
- Establish similar performance standards for related functions.
- Simplify and abbreviate guidance for different types of facilities, eliminating redundant information.
- Include graphics illustrating spatial relationships as well as siting, energy, environmental, and material performance standards.
- Include photos of typical facilities in lieu of floor plans, elevations, perspectives.
- Convey design objectives without dictating solutions.

Developing design policies which would achieve all of these objectives is a Herculean task. Balancing needs of the Air Force as user and landlord with concerns for variety, land use, the environment, energy, and life-cycle costs involves complex and often conflicting design trade-offs. **But it's time to start.** E&S

CAPTAIN BURRILL *is the Chief of Programs, 6917 Air Base Squadron, San Vito Dei Normanni AS, Italy. He received his bachelor's degree from Princeton University and his master's degree from Washington University, St. Louis. He is a Registered Architect in Maryland and is a full member of the American Institute of Planners.*

WORTH NOTING

Computer Directed Training System Provides On-Site Training

Four courses designed to train personnel working with BEAMS are available via Computer Assisted Instruction (CAI) over all remotes supported by the B3500 computer. These courses are:

- CDTS55470-01, BCE Cost Accounting Specialist.
- CDTS55470-02, Real Property Management Specialist.
- CDTS55570-01, BCE Work Control Specialist.
- CDTS64550-10, BCE Material Control Specialist.

Course announcements are scheduled to appear in the December 1976 revision to AFM 50-5, Volume III, Chapter 3.

The courses are comprised of a series of CDTS lessons; each lesson requires approximately two hours at the remote for completion. However, if the training is interrupted before a lesson is completed, it automatically resumes where it left off whenever that lesson is accessed again by the same individual. Complete lesson descriptions are contained in AFM 50-108, Volume III, Chapter 12.

An on-going effort is made to ensure course content is current. Each change to AFM 85-200 is screened and the lessons are updated to include new or revised material. Inquiries and recommendations for improvements should be sent to USAFSAAS/TCTC-CAI, Sheppard AFB, TX 76311 (AUTOVON 736-2056).

Eligibility for FY 78 Selection in ASTRA Program Outlined

Each year volunteer civil engineering officers are considered for the ASTRA (Air Staff Training) Program. To be eligible for FY 1978 selection, officers must have a TAFCSD in 1970, 1971 and 1972; if rated, they must have three years rated duties as of 1 January 1977; and if overseas, have a DEROS between 1 October 1977 and 30 September 1978. Additionally, if serving in the CONUS, one year TOS as of 1 January 1977, is highly desirable. Interested officers should volunteer on AF Form 90 by placing ASTRA (APDS Code XA) in Block 33.

Seven Positions Available in Army/Navy Exchange Program

Seven officer exchange positions will be filled during the summer of 1977. Two Army positions, which are captain authorizations, are available with the Corps of Engineers in the Washington DC District, Fort Belvoir and the Rocky Mountain District, Colorado Springs; and a major authorization is open in the Federal Preparedness Agency, Berryville, Virginia.

Three Navy positions are with Public Works Centers. Two are captain authorizations at San Francisco Bay and Guam and the third is a captain/major authorization at Corpus Christi. Another Navy position is for a captain with a "Seabee" Unit at Gulfport, Mississippi. The "Seabee" Unit makes two deployments: Okinawa, September 1976 to April 1977, and Diego Garcia, November 1977 to July 1978.

Interested personnel should volunteer by placing AH for any service, AJ for Navy and AM for Army in Block 33 of the AF Form 90. For additional details check with your CBPO or call PALACE BLUEPRINT, AUTOVON 487-3451.

Name Inadvertently Omitted

Col James N. Hicks, Jr, Director of Operations & Maintenance, DCS/Engineering and Services, Headquarters Pacific Air Forces, was inadvertently omitted from the listing of officers in the "End of Summer Positions" article, published in the August 1976 issue.

Yokota AB Commissary Named Best in the Air Force by ALA

The Yokota AB (Japan) Commissary was presented the L. Mendel Rivers Award, signifying the best commissary in the Air Force, during the annual awards luncheon of the American Logistics Association in Miami Beach, Florida, recently. The award is sponsored by the Association.

First runnerup was the commissary at Vandenberg AFB, California, and second runnerup was the commissary at George AFB, California.

Dr Billy Welch Named for New Post at Aerospace Medical School

Dr Billy Welch, Special Assistant for Environmental Quality, Secretary of the Air Force (Installations and Logistics), will become the Deputy Director of the US Air Force School of Aerospace Medicine, Aerospace Medical Division, Air Force Systems Command, Brooks AFB, Texas. The announcement was made on 18 September 1976.

Professional Military Education includes three schools which are designed to improve the executive potential of the officer force. Here is the latest accounting on the objectives, how the engineering and services officer force is doing and what you can do to . . .

Enhance Your Potential Through PME

by Lt Col Marvin T. Howell, PE

Editor's Note: The following article was written at the direction of Maj Gen Robert C. Thompson. For the first time ever, all of the procedures for selection for professional development opportunities have been brought together in a concise format. It behooves all officers to take advantage of the opportunities available.

Professional Military Education (PME) includes Squadron Officer School (SOS), Intermediate Service School (ISS) and Senior Service School (SSS). By completing PME, an officer increases his qualifications for further education, increased job responsibility and advancement while gaining additional knowledge about the profession of arms.

The following discussion addresses how you can enhance your potential through PME. It covers program objectives and nomination and designation procedures, and offers an assessment of how Air Force engineering and services officers are doing.

Squadron Officer School

Objective: SOS prepares the junior officer (less than eight years total active federal commissioned service) for basic command and staff tasks while providing a foundation for further professional development. In engineering and services today, we are behind the power curve. Our percentage of officers possessing SOS is too low and our timing to achieve maximum results is definitely off.

How Well Are We Doing? **Figure 1** shows our percentage of completion by rank. We don't expect all second lieutenants to have completed SOS, but all career minded first lieutenants and captains should achieve this career milestone. **Figure 2** and **Figure 3** show when our engineering and services officers are completing SOS. We are peaking in both resident and nonresident programs at the six year point for 55XX and at the three and seven year points for 62XX. When is the most opportune time for any officer to have completed SOS? The author suggests that the best time is prior to the fourth year, preferably at the three year point, which is prior to being considered for captain, regular augmentation, and a graduate program. During the last FY 77A Temporary Captain Selection Board, the civil engineering first time eligible selection rate was 89 percent, compared to 92 percent for the Air Force line. Our promotion selection rate could have been possibly higher if more of our officers had completed SOS. The Services first time eligible selection rate was 93 percent, representing the first time ever that the Services Captain Board had achieved a higher rate than the Air Force line. **Figure 3** shows that Services officers are peaking prior to the fourth year on their nonresident SOS program. **Our future objective must be to get more company grade officers enrolled in SOS and encourage them to complete it prior to their fourth year.**

Figure 1: Squadron Officer School (Percentage of completion by rank).

	Engineering	Services
2nd Lt	3%	9%
1st Lt	14%	22%
Captain	67%	61%

There are certain grade, performance and retainability prerequisites for attendance in residence, but the moment you walk on base as a second lieutenant, you are eligible for the correspondent program.

Eligibility requirements for SOS, that is, excellent military performance with at least two years, but no more than seven years promotion list service, are included in **AFR 53-8**. Selection for SOS

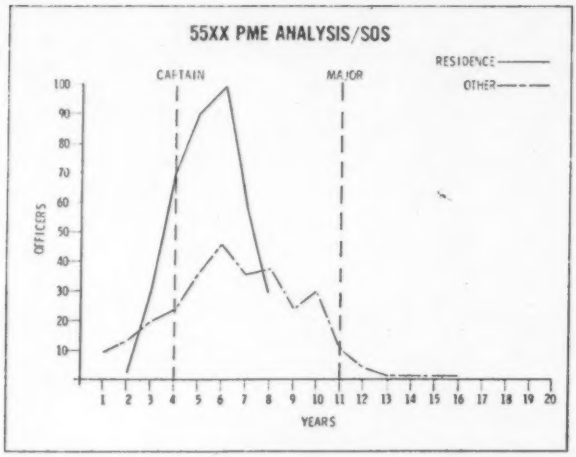


Figure 2: When Engineering Officers Complete SOS.

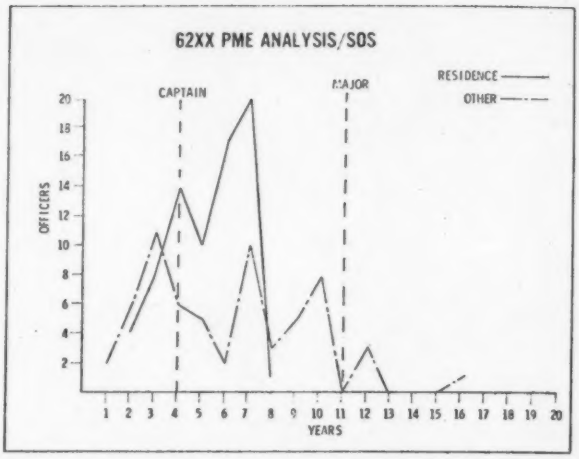


Figure 3: When Services Officers Complete SOS.

in residence is accompanied normally by your major command. However, another option is to volunteer to serve a short tour and be guaranteed SOS attendance enroute to, or from, the oversea area. To be selected for SOS under this program, you cannot be within 12 months of selection for a short oversea tour. Applications are submitted on your AF Form 90 and must include references to **AFR 53-8** and **AFR 36-20** and state a preference to attend SOS either enroute to or from the oversea tour. If not accepted for SOS attendance, your oversea volunteer status is cancelled.

ISS and SSS Selection Process

Selection Process: Prior to assessing how we are doing in these two levels of PME, let's discuss how resident PME selection is accomplished. Officers are nominated for attendance in residence by a board convened as an adjunct to the temporary major promotion board (ISS) and temporary lieutenant colonel promotion board (SSS). Notification is made shortly after the promotion announcement. Nomination to ISS and SSS is on a "best qualified" basis using the promotion board ranking as a means of identifying the officers. Normally 100 percent of the officers promoted below-the-zone are nominated. The remaining officers are identified from the top scoring of the primary promotees. Nomination in no way assures attendance, **Figure 4.**

Once nominated, the questions of if, when and which school the officer will attend are determined by an annual designation board convened at the Air Force Military Personnel Center (AFMPC). Officers are designated to attend at the earliest possible time during their four year zone of eligibility. Usually this occurs at the time an officer is

Figure 4: PME Nomination.

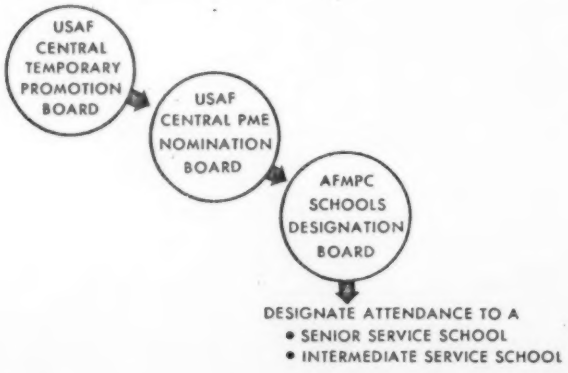

USAF CENTRAL TEMPORARY PROMOTION BOARD
USAF CENTRAL PME NOMINATION BOARD
AFMPC SCHOOLS DESIGNATION BOARD
DESIGNATE ATTENDANCE TO A
• SENIOR SERVICE SCHOOL
• INTERMEDIATE SERVICE SCHOOL

Figure 5: Intermediate Service Schools (Resident).

School	FY 77 Line Quotas	Location	Duration/ Starts
Armed Forces Staff College	172	Norfolk, VA	22 Wks-Jan/Aug
*Air Command and Staff College	412	Maxwell AFB, AL	40 Wks-Aug
*Army Command & General Staff College	40	Ft Leavenworth, KA	10 Mos-Aug
Navy War Command (Command & Staff Course)	14	Newport NAS, RI	10 Mos-Aug
Marine Corps Command & Staff College	2	Quantico, VA	10 Mos-Aug
Canadian Forces Staff College	2	Kingston, Ontario	11 Mos-Sep
Royal Air Force Staff College	1	Bracknell, UK	6 Mos-Jan/Jul
German Armed Forces Staff College	1	Hamburg, Germany	2 Yrs-Oct
Army Command & General Staff Course-School of Americas	1	Ft Gulick, Canal Zone	10 Mos-Feb
	645		

*Only two schools where a major select who does not yet have the rank on can still attend. Others you must have the major leaves on prior to attending.

Figure 6: Intermediate Service Schools (Nonresident).

Method:	Correspondence	Seminar
—AC&S College	Yes	Yes (Now takes only one year)
—AFSC	No	No
—Army Command & General Staff College	Yes	No
—Navy Command & Staff Course	Yes	No

Eligibility: Officers must possess PLSD of 7 years or greater. Of the 18 maximum allowed, only five can be captains (space available basis).

available for PCS. The designation boards further consider education and experience, performance and future utilization. Therefore, **be sure to state your preference and include meaningful reasons that would help the board in making its selection.**

Completion by correspondence does not prevent nomination or attendance in residence. In fact, it may increase your chances for selection if you complete it prior to being considered for major (ISS) and lieutenant colonel (SSS). Why? One is because nominees are identified by their standing on the promotion list and, two, completion of PME through self-initiated means could favorably affect that position. All officers cannot be nominated for the resident program but nonresident opportunity

Figure 7: Senior Service Schools (Resident).

School	FY 77 Quotas	Location	Duration/ Starts
Air War College	196	Maxwell AFB, AL	10 Mos-Aug
National War College	38	FtMcNair, Wash DC	10 Mos-Aug
Industrial College of Armed Forces	61	FtMcNair, Wash DC	10 Mos-Aug
Army War College	16	Carlisle Barracks PA	10 Mos-Jul
Naval War College (Naval Warfare Course)	16	Newport NAS, RI	10 Mos-Aug
RAF College of Air Warfare	3	Manby, England	6 Mos-Jun/Jan
NATO Defense College	5	Rome, Italy	6 Mos-Sep/Feb
Royal College of Defense Studies	1	London, England	11 Mos-Jan
Canadian Forces National Defense College	1	Kingston, Ontario	10 Mos-Sep
Department of State Seminar in Foreign Policy	1	WashDC	10 Mos-Aug
Inter-American Defense College	1	WashDC	10 Mos-Sep
	339		

Figure 8: Senior Service Schools (Nonresident).

Method:	Correspondence	Seminar
Air War College	Yes	Yes (Now only takes one year)
ICAF	Yes	Yes (Limited Number)
Army War College	Yes	No
Navy War College	Yes	No
National War College	No	No

Eligibility: Air War College, ICAF, Army War College and Navy War College must be a major or higher. A major must have an intermediate service school by either residence or nonresidence method. ICAF will no longer make a grade waiver (must be a major or higher). Three majors per AWC seminar with at least two years time in grade as of volume start date may participate in seminar. Other participants in AWC seminar must be lieutenant colonels or colonels.

is available for everybody. So if you were not nominated at the time you were promoted, get enrolled immediately in the nonresident program.

Residence or Nonresidence? If you get the chance, go in residence. If not, take it by seminar or correspondence. As previously mentioned, taking it by seminar or correspondence first may help you to be nominated to attend in residence. The resident course with its guest speakers and full time curriculum is certainly a well presented, worthwhile program. It should be your first goal. Resident attendance exposes you to contemporaries with a broad base of experience, improves your writing and speaking skills needed for executive management, and develops your working relationships and friendships with other Air Force managers which could continue throughout your career.

Completion by correspondence or seminar demonstrates initiative and the desire to improve and will enable you to do a better job. The most popular nonresident program for engineering and services officers is Air Command and Staff College (AC & SC) by correspondence for ISS and Industrial College of the Armed Forces (ICAF) by correspondence for SSS. Changing the seminar program so that it can be completed in one year may increase the enrollment in both AC & SC and Air War College (AWC) by seminar. **Figure 5, Figure 6, Figure 7,** and **Figure 8** show the nonresident and resident programs that are available for ISS. Therefore, let's summarize with saying, "The most essential point is to complete SOS, ISS and SSS regardless of the method."

Intermediate Service School

Objective: ISS is intended to "prepare officers for command and staff duties as majors and lieutenant colonels." By performing an analysis to determine when the majority of our officers have experienced a staff assignment and taking into account historically our normal grade substitution,

Figure 9: Intermediate Service Schools (Percentage of completion by captains and majors).

	Engineering	Services
Captain	10%	12%
Major	33%	30%

we arrived at an objective that at least 70 percent of our officers should have ISS by their 11th year to prepare themselves for these jobs; therefore, we should encourage more captains (over seven years in service) to complete ISS. It will increase their ability to do a better job while increasing their potential.

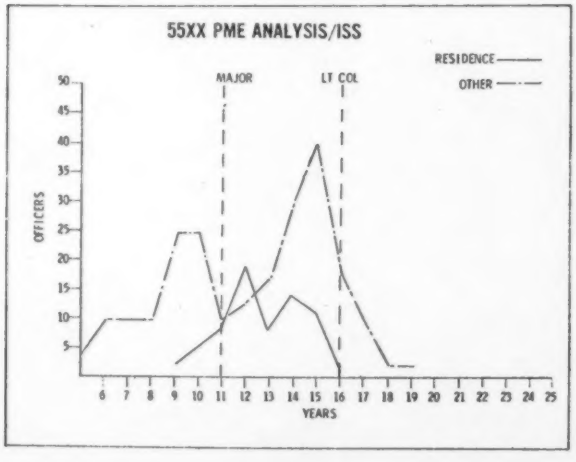
How Are We Doing? Figure 9 shows the small percentage of captains and majors completing ISS. Figure 10 and Figure 11 show when we are completing ISS. For engineering officers, not only is the percentage of participation low, the peak is at the 16th year and for maximum results should be prior to the 11th year. Services officers are completing it at the right time but not in sufficient numbers.

Senior Service School

Objective: The SSS objective is to "prepare lieutenant colonels and above for high command and staff jobs." Our objective should be to increase our participation, and shoot for at least 50 percent of our lieutenant colonels to have SSS. Twenty-five percent of all colonel jobs have been designated as requiring and 75 percent desiring SSS. With the challenging, responsible management jobs we have in engineering and services, the 50 percent goal would seem to be the very minimum we should achieve.

Resident and Nonresident Schools (Figure 7 and Figure 8): Another prerequisite for resident attendance is that the officer must be a lieutenant colonel or colonel with less than 21 years PLS. Remember

Figure 10: When Engineering Officers Complete ISS.



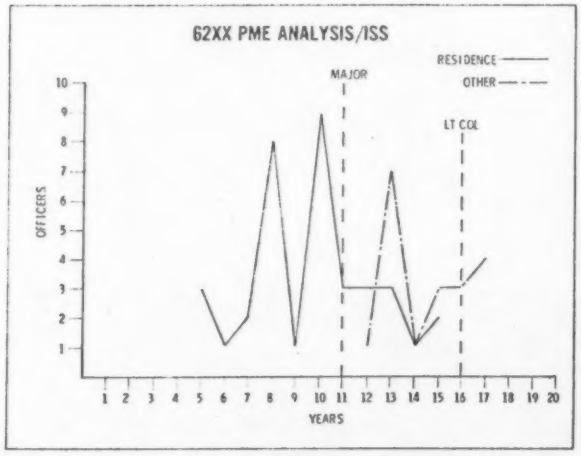


Figure 11: When Services Officers Complete ISS.

the importance of the Career Objective Statement (AF Form 90) in conveying to the AFMPC Designation Board where you would like to attend and why. For nonresident programs, ICAF by correspondence is now the most popular method for our career fields but the new one year AWC Seminar program may gain significantly in popularity.

How Are We Doing? We are completing SSS at the right time (prior to the 16th year) but our percent completed is low, Figure 12, Figure 13 and Figure 14. The large number completing SSS in the 16th and 20th year is excellent, but for maximum results, completion prior to the 16th year would be better.

Summary: Figure 15 shows the number and percentage of our officers who do not have any PME. Our challenge is clear. Putting the engineering and services officers noncompletion rates together, we ask you, can we afford 97.3 percent of the second lieutenants, 84.3 percent of our first lieutenants, 34 percent of our captains, 14.9 percent of our majors, and 9.9 percent of our lieutenant colonels with no PME? We think not; the time to act is now to assure a continued viable engineering and services officer force. Completion of PME is a definite career development goal that all of us should strive to achieve. In future articles in this magazine we will show our progress. Let's make our progress notable and continue to improve the executive potential of our engineering and services officer force. Although PME does not guarantee selection for promotion or special assignments, it certainly can be helpful. Yes, a few officers are promoted without any PME, but don't you count on being the "one who made it without PME."

Figure 12: Senior Service School (Percent Completed).

	Engineering	Services
Majors	18%	9.5%
Lt Colonels	36%	30.0%

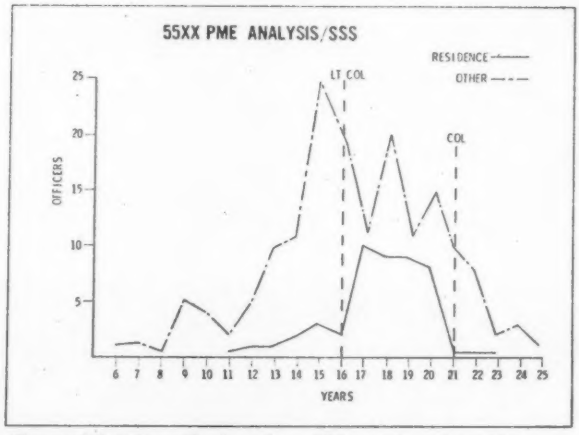


Figure 13: When Engineering Officers Complete SSS.

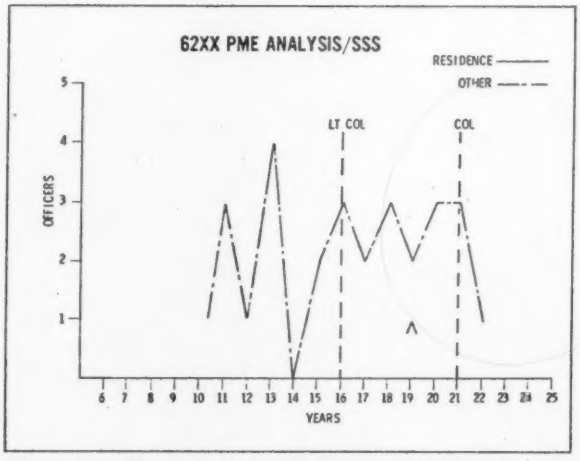


Figure 14: When Services Officers Complete SSS.

	CE (#)	Services (#)	CE	Services
Colonel	7	3	7%	33%
Lt Colonel	26	7	10%	12%
Major	52	12	15%	16%
Captain	230	53	33%	39%
1 Lt	219	39	86%	78%
2 Lt	249	21	97%	91%
	783	135	40%	38%

Figure 15: Officers with No PME.

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73 Named for Promotion to the Rank of Captain

Seventy-three engineering and services officers have been selected for promotion to captain by the Temporary 1977B Captain Board which was held at the Air Force Military Personnel Center on 19 July. The 13 services officers who were selected represented a 93 percent promotion rate (Air Force was 89 percent). It marked the second time in a row that the promotion statistics of the services field exceeded the Air Force line.

Selectees are:

Name	Base
Adams, Terry R.	Barksdale
Allen, Dale H.	Osan
Andersen, Thomas B.	Moody
Artman, David H., Jr	Tyndall
Austin, Arthur E., Jr	Hill
Barker, Donald L.	Indian Mountain
*Baucom, Terry L.	Homestead
Beally, Timothy N.	Osan
Becker, Henry O.	Randolph
Berry, James R.	Campion
Best, Anthony J.	Eielson
Beyer, Gregory T.	Elmendorf
*Bradham, Gary C.	Dyess
*Brady, William A., Jr	Andersen
Chang, Stanton A.	Kirtland
Clements, Gary A.	Sheppard
Cole, Jerry D.	Kelly
Cole, John R.	Fairchild
Collons, Fester	Bitburg
Cotten, John P.	Malmstrom
DeLong, Hugh K., III	Cape Lisburne
Demoret, Guy W., II	McConnell
Drake, William J.	Eielson
*Ellison, James D.	Eielson
Eng, William F.	USAFA
Evans, John D.	Osan
*Evans, Michael R.	King Salmon
Fiertner, Alfred J.	Kelly
Fink, Patrick T.	Tyndall
*Frazier, Edwin B., Jr	Barksdale
Galloway, Rodney G.	Kirtland
Gilbert, Russell L.	L.G. Hanscom
Goetz, William T.	Malmstrom
*Gold, Morton J., Jr	Robins
Goltz, Mark N.	Osan
*Helmich, Larry E.	Galena
Huelskamp, David G.	Williams
Johnson, James I.	Little Rock
Karvosky, Richard J.	Pope
Keyes, Harry S.	Loring
Lemaster, Wayne L.	Ft Yukon
Love, Francis E.	L.G. Hanscom
Mayer, Claude C.	Wurtsmith
McDonald, Thomas J.	Scott
McKinnis, William C., Jr	George
McPhee, Robert S.	Plattsburgh
Meints, Jeffrye S.	Fairchild
Morrison, Dennis	Tyndall
*Muhl, Michael A.	Thule
Oakley, Michael P.	K.I. Sawyer
Omeara, Michael T.	Williams
Palffy, John R., Jr	Pease
Patrick, Michael R.	AFIT, W-P
Patterson, Joseph G.	Lowry
Pearson, William R.	Hill
*Perrie, Alfred H.	USAFA
Poe, Carl M.	Davis-Monthan
Roberts, Gregory L.	Kingsley Field
Sain, Edward R.	McGuire
*Scheinost, Barry J.	K.I. Sawyer
Shierk, Theodore T., Jr	Offutt
Tickel, Jobe C., Jr	San Vito
Tolbert, William A.	USAFA
Tomlin, James C.	Kadena
*Tyce, Michael J.	Torrejon
Vachon, William H.	Cold Bay
Vavroch, Gregory L.	McConnell
Veren, Andrew D.	Sheppard
Werner, Kenneth W.	Andersen
Wesley, David J.	Bolling
*White, David L.	Beale
Williams, Robert S.	Homestead
Woods, Michael D.	Mather

*Services Officers

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